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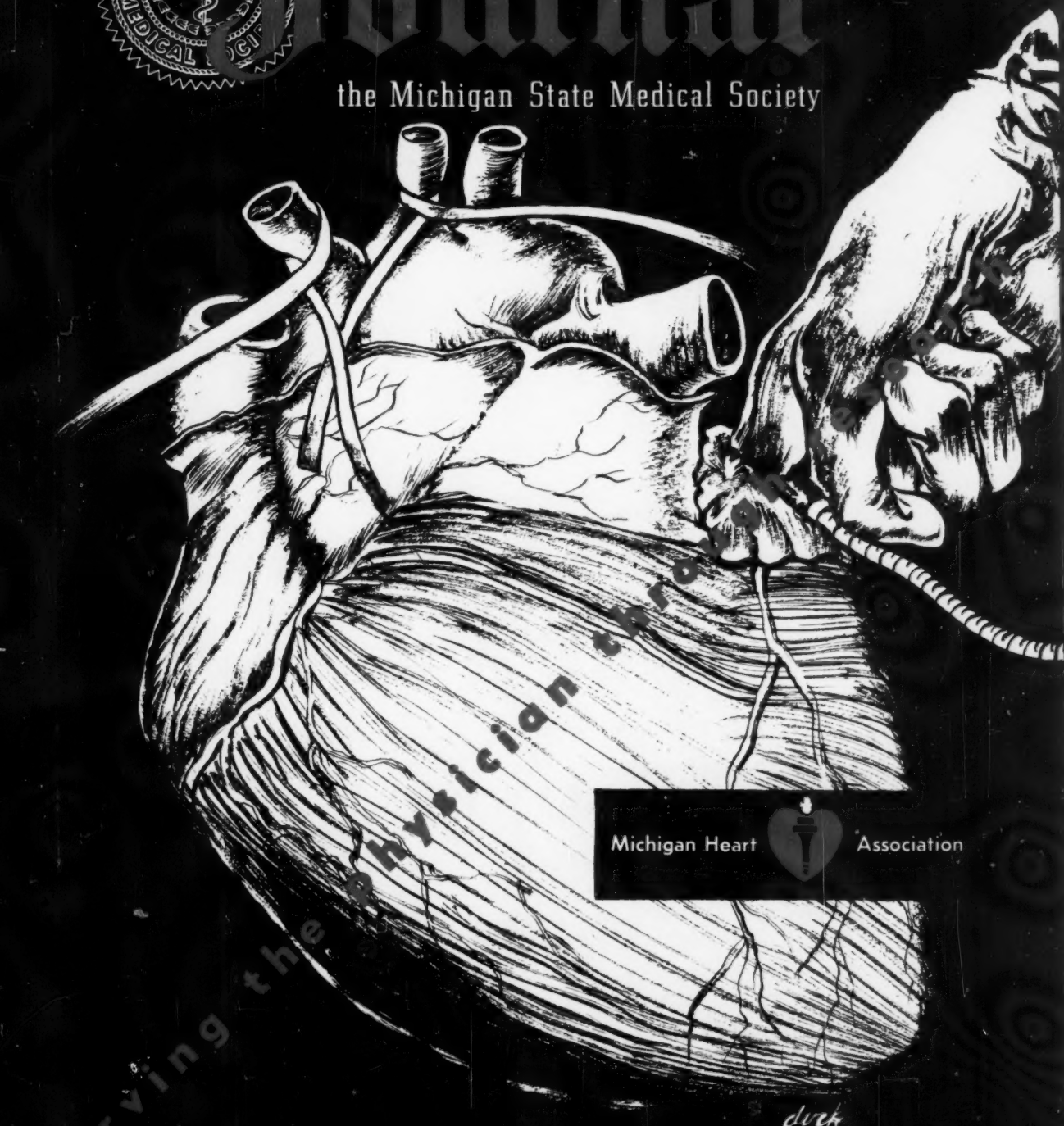

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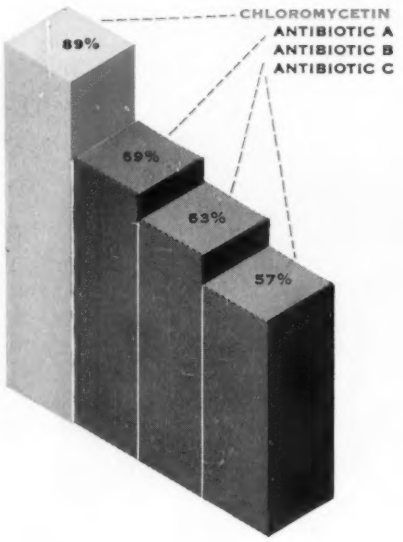
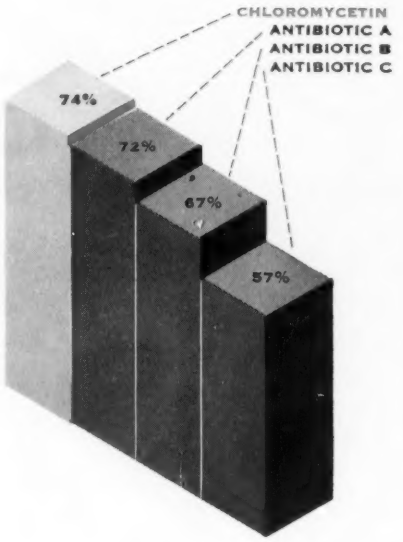
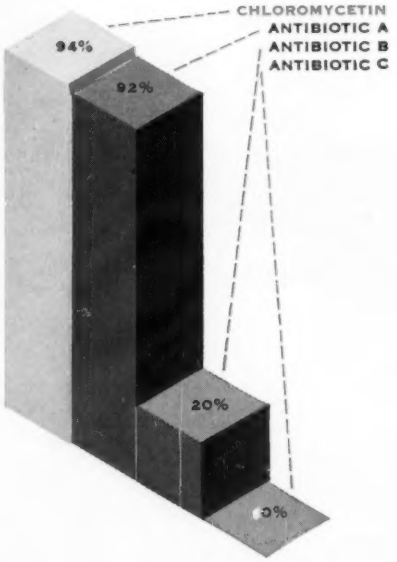


NONHEMOLYTIC MICROCOCCUS AUREUS
(363-418 STRAINS)



HEMOLYTIC MICROCOCCUS AUREUS
(729-776 STRAINS)



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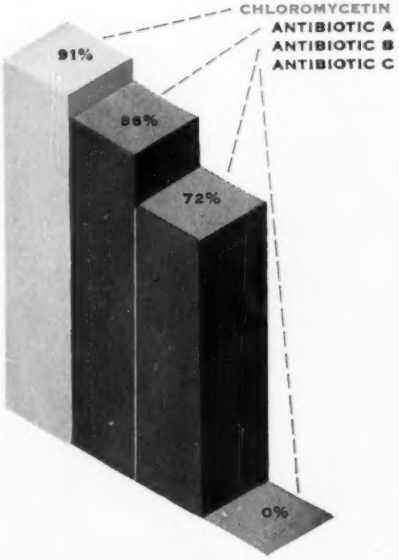
(478-586 STRAINS)



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This graph is adapted from Altemeier, Culbertson, Sherman, Cole, Elstun, & Fultz.[1]

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H. Gass, M.D.

S. W. Hoobler, M.D.

C. G. Johnston

R. C. Moehlig, M.D.

Y. Morita, M.D.

J. A. Polhemus, M.D.

H. J. Robb, M.D.

J. F. Sander, M.D.

J. Starkman, M.D.

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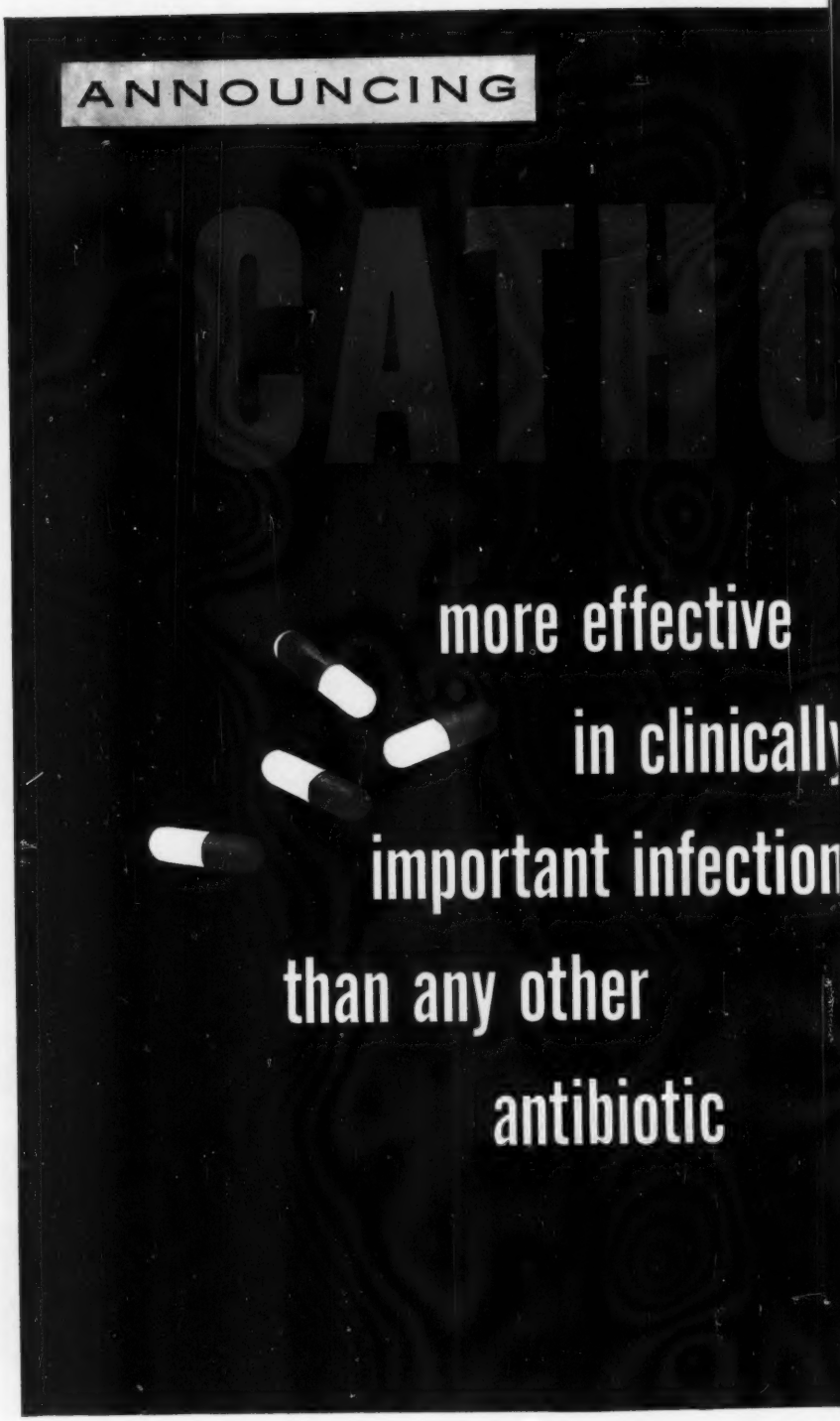
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(Continued from Page 8)

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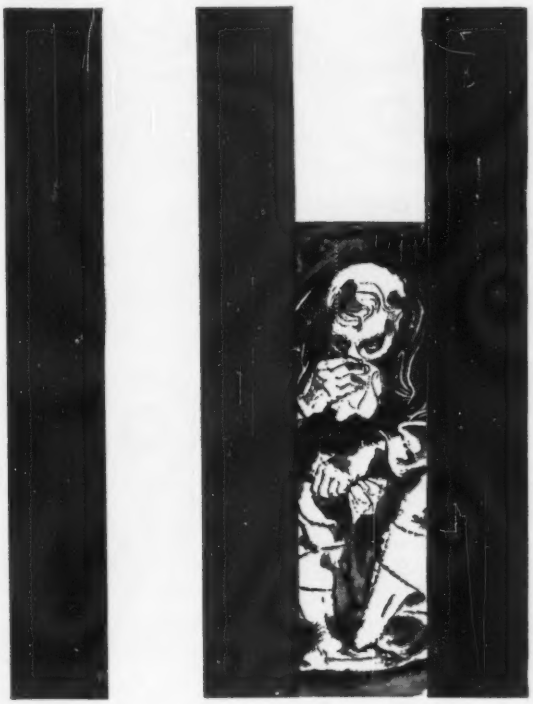

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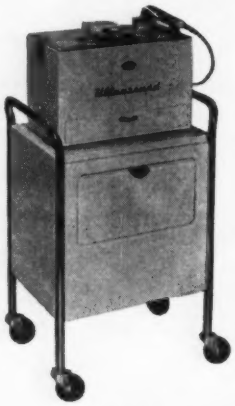

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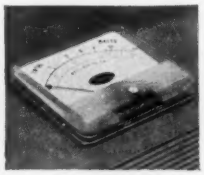

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CLOSED CIRCUIT COLOR TV

An outstanding color television program will be beamed to the Grand Ballroom of the Sheraton Cadillac Hotel, Detroit, through the co-operation of The Grace Hospital Staff and Smith, Kline & French Laboratories of Philadelphia.

(See pages 96-97.)

IMPORTANT HOUSE OF DELEGATES ACTIONS—1956

The MSMS legislative body, meeting in Detroit, September 24-25, 1956, adopted resolutions (a) urging establishment of departments of general practice in medical schools' curricula; (b) instructing that a committee be appointed to study the use of the word "clinic"; (c) instructing that a permanent advisory committee on fees be appointed; (d) objecting to Michigan's Attorney General's Opinion that the practice of psychotherapy is the practice of medicine; (e) urging expansion of medical school facilities at Wayne State University; (f) urging adequate funds to carry out civil defense; (g) directing The Council to build a new MSMS headquarters; (h) instructing that a committee be appointed to study excess beds in tuberculosis sanitoria; (i) urging total participation of Michigan M.D.'s in Michigan Medical Service; (j) urging more comprehensive prepaid medical care insurance plans and Blue Shield plans for diagnostic out-patient services.

Resolutions re Michigan Medical Service

The more important resolutions concerning Michigan's Blue Shield were the following:

Resolution Urging Total Participation of M.D.'s in Michigan Medical Service

(Substitute resolution approved by 1956 MSMS House of Delegates)

Whereas, there is an apparent lack of full understanding and appreciation of the basic principles and philosophy of Michigan Medical Service, and

Whereas, the survival of the voluntary system of prepayment medical care depends on unity within this State Medical Society; therefore be it

RESOLVED, That the House of Delegates recommend to each county medical society that it include in its indoctrination of new members a thorough explanation of the principles, practices and objectives of Michigan Medical Service; and be it further

RESOLVED, That this State Medical Society, its members and officers, assist each county medical society in its campaign to see that Michigan Medical Service continues as the most successful medically-sponsored prepayment plan.

* * *

Resolution re Comprehensive Prepaid Medical Care Insurance Plan

(Substitute resolution approved by 1956 MSMS House of Delegates)

Whereas, it is the proper role of medicine to assume leadership in determining the type and form of prepaid medical care plans, and

Whereas, a prepaid medical care plan ideally should embody within it a sense of mutual responsibility on the part of the physician and on the part of the patient, and

Whereas, a medical care plan should preserve the traditional right of the patient to select the physician of his own choosing; therefore be it

RESOLVED, That the Michigan State Medical Society approve exploration with Michigan Medical Service of a comprehensive prepaid deductible and/or coinsurance contract and also the possibility of extension of the present contract; and be it further

RESOLVED, That the Speaker of this House of Delegates be authorized to appoint forthwith a special committee to accomplish the following:

A—Meet with the representatives of Michigan Medical Service to study and develop details and mechanisms.

B—Initiate, as a joint endeavor and in co-operation with Michigan Medical Service, necessary studies to ascertain what would best serve the public.

C—Prepare a complete report for presentation to the House of Delegates at its meeting in 1957 with the proviso that copies of this report shall be sent to each member of the House of Delegates by August 15, 1957.

* * *

Resolution re Michigan Medical Service Annual Report to MSMS House of Delegates

(Substitute resolution approved by 1956 MSMS House of Delegates)

Whereas, the Michigan State Medical Society established Michigan Medical Service with the intention of providing medical services on a voluntary basis through a prepayment plan, and

Whereas, the expansion of Michigan Medical Service

(Continued on Page 16)

NEW

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the first and only ataraxic-corticoid

Ataraxoid*

prednisolone and hydroxyzine

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(Continued from Page 14)

has become a significant factor in the practice of medicine in the State of Michigan, and

Whereas, the members of the House of Delegates of the Michigan State Medical Society usually function as the legally qualified members of the corporation of Michigan Medical Service on the second day of their annual meeting and do not have a report submitted along with the reports of other Society activities as published in the Delegates' Handbook; therefore be it

RESOLVED, That the annual report of Michigan Medical Service be included in the Handbook for Delegates for informative purposes.

Dues Increase Eliminates Assessment

Two actions of the House of Delegates increased the dues by $10.00, at the same time abolishing the $10.00 assessment of 1956. The first was a resolution setting aside $5.00 annual dues to build and equip a new MSMS headquarters building; the second was approval of the report of the Committee on Study of MSMS Financial Structure which included a $5.00 dues increase to permit the continuation of the modern MSMS program at its current level:

Resolution re New MSMS Headquarters

(Approved by 1956 MSMS House of Delegates)

Whereas, increasing demands for service are being made upon the MSMS by the medical profession and the public, and

Whereas, such demands must be met by well-planned and effectively executed programs, and

Whereas, the administration of such programs must of necessity center in the Executive Office of MSMS, and

Whereas, present Lansing facilities for the Executive Office are already strained to the utmost and unless expanded shortly will hamper the efficient execution of MSMS programs, and

Whereas, it is reliably estimated that a proper headquarters can be built and equipped for an amount approximating $300,000, therefore be it

RESOLVED, That a new MSMS headquarters be built and equipped in Lansing, Michigan; and be it further

RESOLVED, That for the building of this new headquarters the sum of $300,000 be raised by:

1. The sale (at the proper time) of our present headquarters.

2. By the use of present building reserves.

3. By the increasing of dues in the amount of $5 per year, beginning in the 1957 fiscal year, said increase in dues to be used only for the purpose of defraying the cost of building and equipping a new MSMS headquarters.

* * *

Conclusions of Committee on Study of MSMS Financial Structure

(Approved by 1956 MSMS House of Delegates)

1. The officers and professional staff of the MSMS are to be commended for their leadership in a program which is sound and well administered.

2. The part-time officers and full-time key professional staff are under- rather than over-paid. The AMA delegates and alternates as well as members of The Council, committees and others active in the Society make a very valuable contribution to the public and Society welfare at a significant personal sacrifice in most instances.

3. Evidence was not produced to justify a reserve equal to two years of Society operation.

4. The current $45 dues and $10 assessment has placed the Society in good condition financially, with a reserve anticipated for December of 1956, of approximately $275,000 to $300,000. During times of stress, such as the last depression or last war, this will permit Society operation at the current level for at least three to four years with a curtailment of 25 per cent of income. With a reasonable curtailment of expenditures, one year's operation without any income whatever is possible. By the same token, a reasonable increase in program is possible with this reserve to meet any possible emergency in the interval between meetings of the House of Delegates.

5. The $10 assessment levied in 1956 should not be renewed.

6. A dues increase of $5 is recommended to protect this reserve, offset higher costs, to permit a continuation of program at its current level, and to adequately reimburse part-time officers, key full-time staff and others.

HIGHLIGHTS OF THE EXECUTIVE COMMITTEE OF THE COUNCIL

Meeting of November 14, 1956

Eighty-nine items were presented to the Executive Committee of The Council at its November 14 meeting in Detroit. Those of chief importance were:

- **Discussion of matters referred** to The Council by the 1956 House of Delegates, including 22 resolutions, the reference committee's report on the Annual Reports of The Council, and the reference committee's report on the recommendations of the Committee to Study MSMS Financial Structure.
- **Medicare Program.** A report on the Washington, D. C., negotiation conference of October 24-25, was presented by Council Chairman Wiley and by Jay C. Ketchum, Executive Vice President of Michigan Medical Service. The Medical Advisory Committee of Michigan Medical Service was designated, as per the request of the Armed Services, to review specific cases (in the nature of a medical advisory committee); Michigan Medical Service was appointed as agent of MSMS for fiscal arrangements under the Medicare Program and the MSMS President was authorized to sign the medicare contract on behalf of the State Society; a letter explaining the Medicare Program, to be signed by President Walls, was authorized to be sent to all MSMS members, to be followed by additional detailed information.
- **President Walls** stated he attended a meeting of the Governor's Study Commission on Public Health in Lansing on October 26 (W. S. Jones, M.D., of Menominee is a member of this Commission) and presented a comprehensive report on health problems from the viewpoint of the Michigan State Medical Society.
- **Speaker K. H. Johnson, M.D.,** Lansing, reported on a session of the Steering Committee to set up a meeting of the Citizen's Public

(Continued on Page 26)

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Michigan Medical Service

One of the most important phases of Michigan Medical Service operations—vital to Michigan doctors and MMS subscribers—is the work of the Wayne County Medical Advisory Board to Michigan Medical Society.

The board, representative of nearly every field of medicine, has for many years contributed invaluable service to members of the medical profession of Michigan and to MMS. In fact, its labors provide assurance to Michigan doctors that unusual and complicated medical and surgical cases receive careful professional consideration where precedent has not been established in the MMS payment schedule.

Just how the Advisory Board functions for MMS is important to all MMS participating doctors in the state. It is important to know what steps are taken before MMS makes payment to the doctor for any complex medical or surgical case requiring more than the usual amount of professional care or skill.

All cases reported on the Doctors Service Report forms, of course, go through the examination department of Michigan Medical Service. If, during this study, a doctor's service report shows any unusual type of work, it is referred to the MMS Medical Director, Dr. Dewey Moll. After close scrutiny by Dr. Moll and his staff, the cases requiring consideration by the Advisory Board are then presented by Dr. Moll to the Board for prompt atention. Cases are presented anonymously to the Board, with identity of the patient and the doctor undisclosed. Only if further information is needed on the case is the doctor's identity made known. The determination of fees by this Board must be in relation to the income limits of the contract carried by the subscriber and must be consistent with the other fee allowances in the $2,500 or $5,000 contracts.

"Fairness to the doctor and the patient is the paramount aim of the Board," Dr. I. S. Schembeck, Chairman, says. "It is our job to recommend to the MMS Board equitable payment of fees for specific cases. These recommendations for payment are reached only after thorough study by the Advisory Board of all the facts involved in each case presented—the extent of the surgery, length of time required to perform necessary procedures and any accompanying complications."

Dr. Schembeck points out that such recommendations for fees can be reached *only* if the doctor has submitted a complete report to MMS of the case in question. He emphasized that much time and expense can be saved by doctors and MMS if the doctors make every effort to submit reports to MMS describing in detail every aspect of their cases. To go a step further, it is even recommended that for unusual cases the doctor send in a copy of his operative notes.

Completeness of reports, Dr. Schembeck explains, automatically expedites handling of complex cases—thereby hastening payment of the MMS fee to the doctor.

"We must know just what work the doctor has done for his patient before we can know whether payment for such procedure has been established in the MMS Schedule of Fees, or whether or not the doctor is entitled to further payment," Dr. Schembeck says. He explains that when the Board receives a report, incomplete in details, MMS must then write the doctor for further information, adding up to considerable delay before a decision can be reached. At times it has been necessary for MMS field representatives to make personal calls on the doctor to clear up facts in cases when reports were inconclusive.

However, a recommendation by the Advisory Board on a specific payment does not have to be final until the doctor indicates his approval. Should the participating doctor feel at any time that the payment recommended by this Advisory Board for his work is not satisfactory, it is his privilege to ask for a re-review of the case. The Advisory Board is always willing to reconsider any case, according to Dr. Schembeck—in fact, will consult with the doctor in person at a meeting of the Board if the doctor so desires. Also, cases which have been paid routinely without the aid of the Advisory Board will be reviewed by that Board if the doctor reporting so desires.

The Advisory Board, originally formed more than fifteen years ago to establish precedent fees, is still concerned with reviewing cases which are different from previous claims and are classified as out of the ordinary procedures.

The Advisory Board has no authority to set fees, policies or practices of MMS, it can only recommend certain action. For instance, if an established fee for a particular procedure appears to be inequitable as part of the set Schedule of Fees, the Advisory Board may recommend to the MMS Board of Directors that such a fee should be reconsidered and changed as being too large or too small a payment for such services. The same action or recommendation may be made for new procedures as they appear. Actually, each individual doctor has this same right if he chooses to have a certain procedure reviewed for modification in the fee allowance.

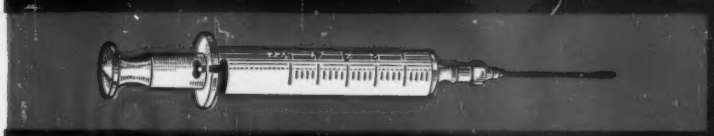
A hard-working group, the Advisory Board meets two days each month, handling approximately 2,000 cases each year. Service by the Board members has always been without remuner-

(Continued on Page 32)

ON THE FOLLOWING FIVE PAGES

MERCK SHARP & DOHME

ANNOUNCES...

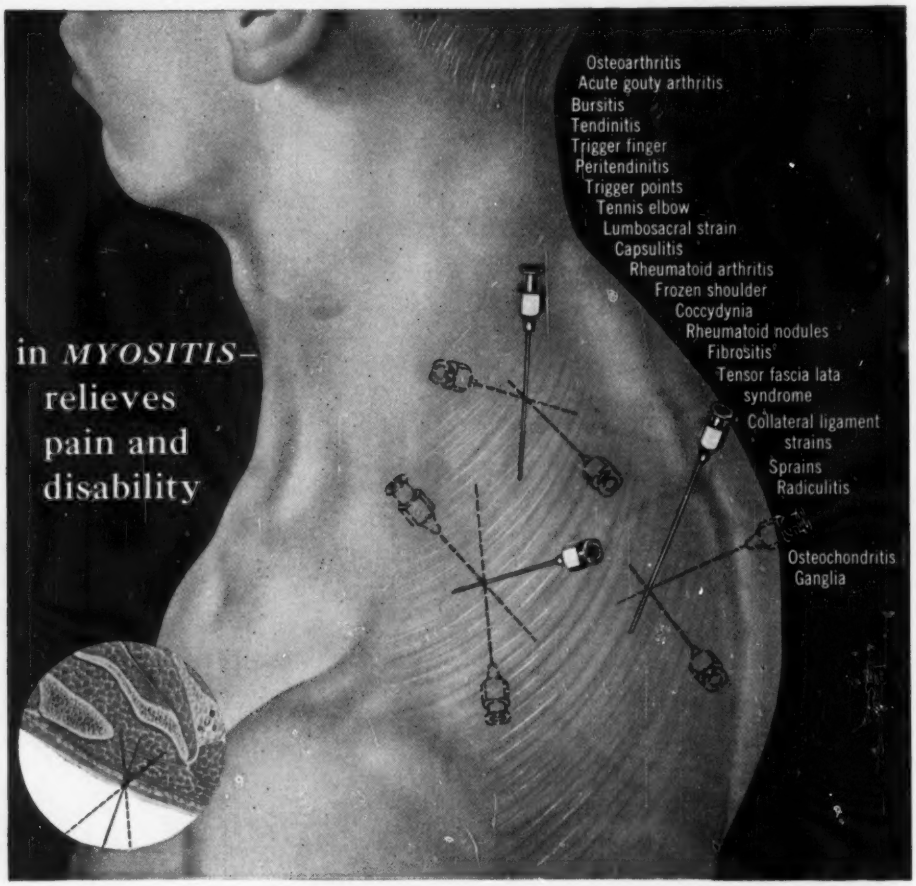


the most
effective,
longest lasting
adrenocortical steroid
yet developed
for
SOFT TISSUE,
intra-articular, and
intra-bursal injection

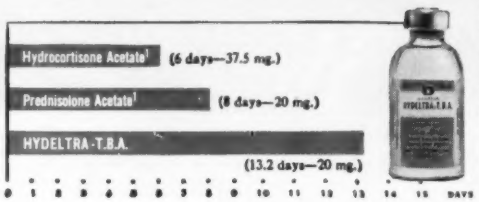
NEW HYDELTRA®-T.B.A.

(Prednisolone tertiary-butylacetate, Merck)

for relief that lasts—longer



Anti-inflammatory effect lasts longer than that provided by any other steroid ester


Hydrocortisone Acetate[1] (6 days—37.5 mg.)
Prednisolone Acetate[1] (8 days—20 mg.)
HYDELTRA-T.B.A.
(13.2 days—20 mg.)
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 DAYS

Dosage: the usual intra-articular, intra-bursal or soft tissue dose ranges from 20 to 30 mg. depending on location and extent of pathology.

Supplied: Suspension 'HYDELTRA'-T.B.A.—20 mg./cc. of prednisolone *tertiary*-butylacetate, in 5-cc. vials.

MERCK SHARP & DOHME
DIVISION OF MERCK & CO., INC.
PHILADELPHIA 1, PA.

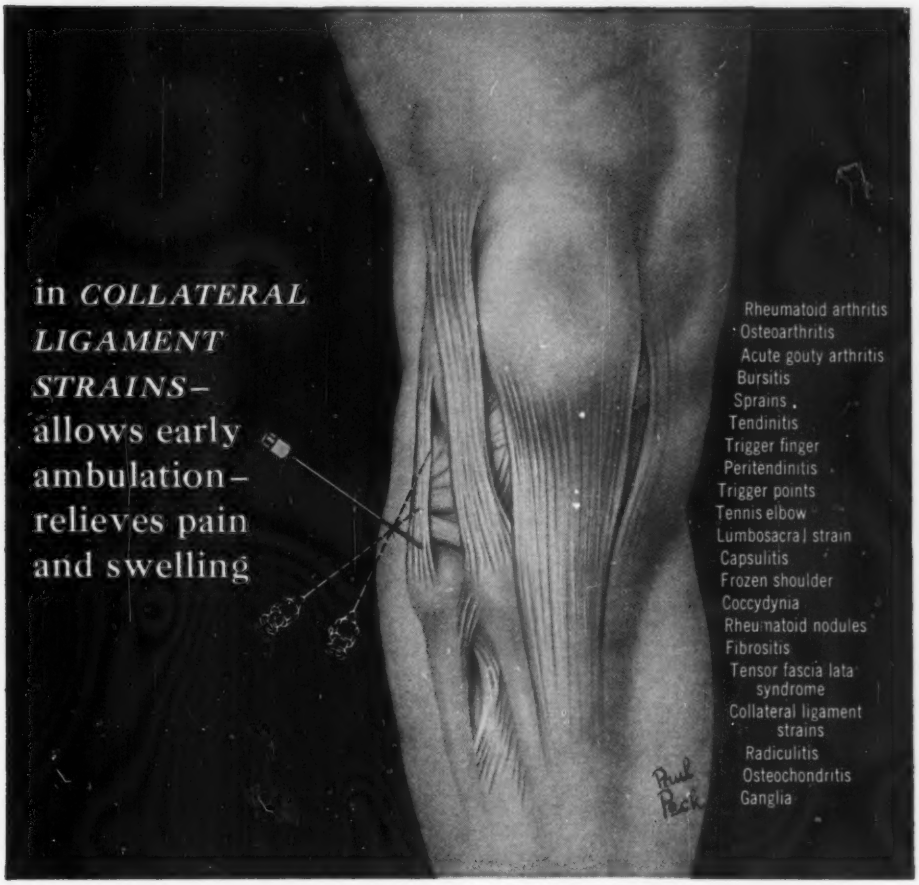
1. Hollander, J. L., *Paper read at conference in New York City, May 31 and June 1, 1955*

NEW

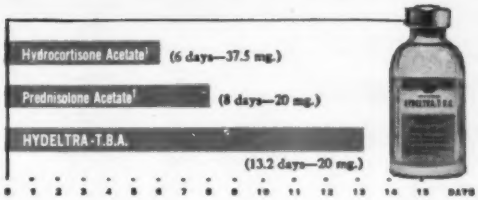
HYDELTRA®-T.B.A.

(Prednisolone tertiary-butylacetate, Merck)

for relief that lasts—longer



Duration of relief exceeds that provided by any other steroid ester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MSD

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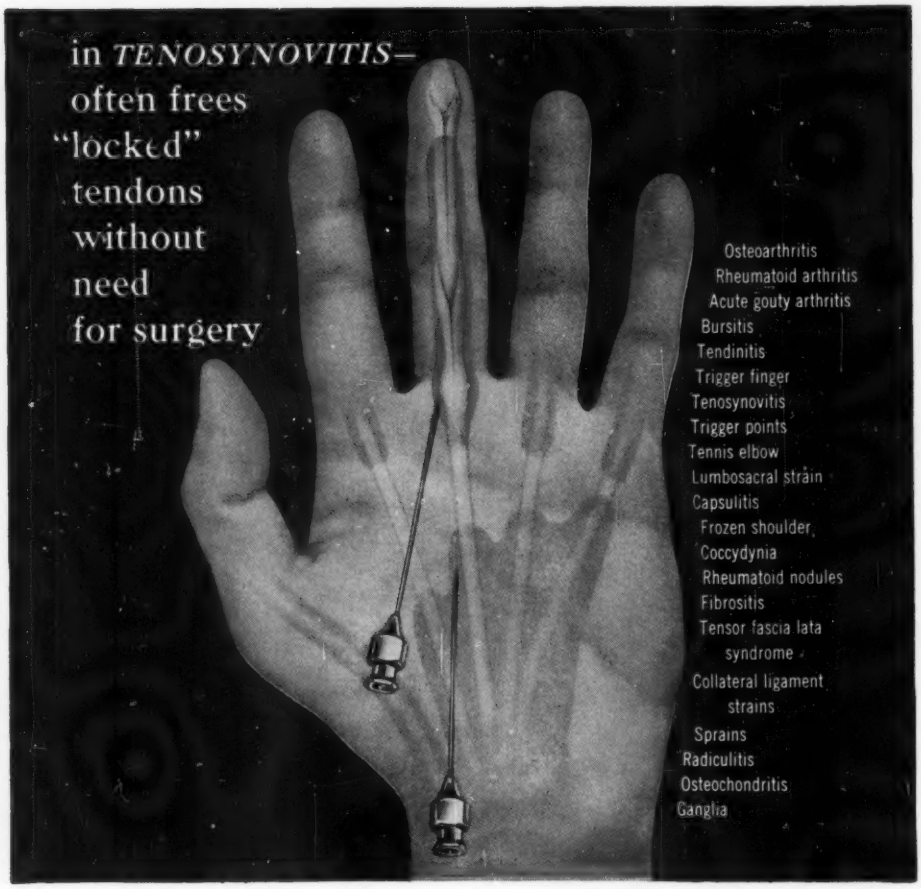

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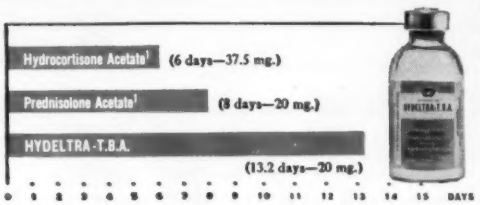
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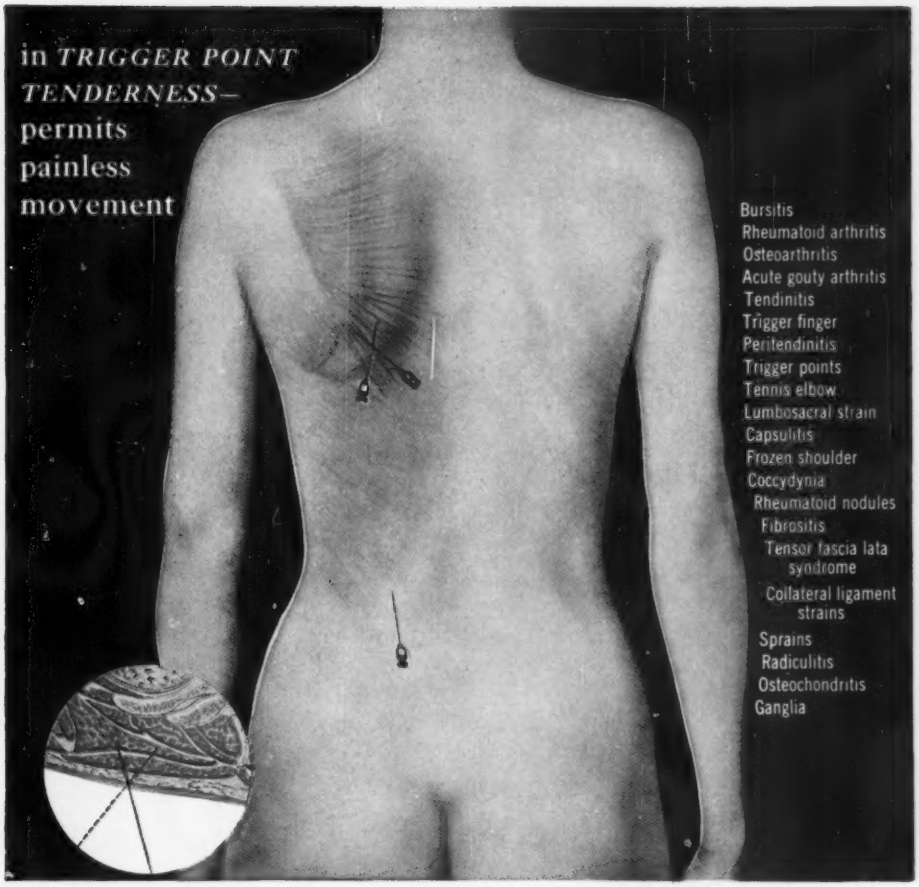

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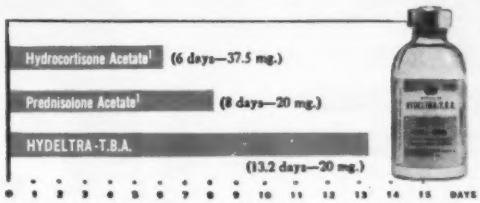
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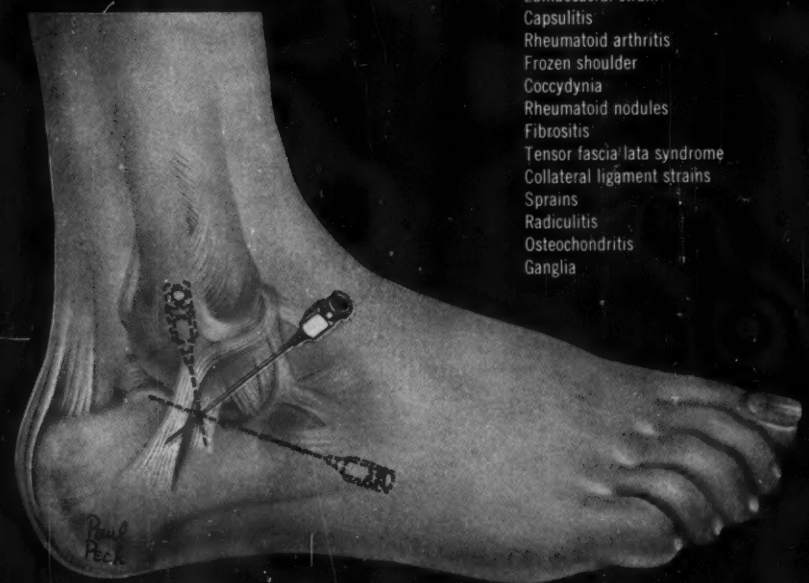
NEW

HYDELTRA®-T.B.A.

(Prednisolone *tertiary*-butylacetate, Merck)

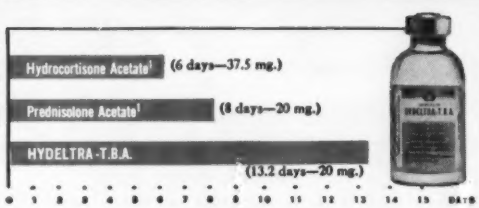
for relief that lasts—longer

in *SPRAINS*—
reduces tenderness,
swelling and
limitation of motion



- Osteoarthritis
- Acute gouty arthritis
- Bursitis
- Tendinitis
- Trigger finger
- Peritendinitis
- Trigger points
- Tennis elbow
- Lumbosacral strain
- Capsulitis
- Rheumatoid arthritis
- Frozen shoulder
- Coccydynia
- Rheumatoid nodules
- Fibrositis
- Tensor fascia lata syndrome
- Collateral ligament strains
- Sprains
- Radiculitis
- Osteochondritis
- Ganglia

Anti-inflammatory effect lasts longer than that provided by any other steroid ester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MERCK SHARP & DOHME
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PHILADELPHIA 1, PA.

1. Hollander, J. L., *Paper read at conference in New York City, May 31 and June 1, 1955*

Doctor, would it be helpful to you in your practice to know that there is a food available at reasonable prices in the stores the year round having these attributes:

1. High public acceptance as to flavor and palatability—billions eaten annually.

2. One of the best of the "protective" foods with a well-rounded supply of vitamins and minerals.

3. Low sodium—very little fat—no cholesterol.

4. Sealed by nature in a dust-proof package.

5. One of the first solid foods fed babies.

6. Can be easily digested by old folks as well as infants.

7. Can be readily eaten out of hand, in milk shakes, on cereals, or in salads.

8. Can be baked, broiled or fried.

9. Can be used as an ingredient product in breads, pies, cakes and desserts.

10. Useful in bland and low-residue diets.

11. Mildly laxative.

12. May be used in the management of both diarrhea and constipation.

13. Can be used in reducing diets.

14. Can be used in high-calorie diets.

15. Useful in the dietary management of celiac disease.

16. Useful in the dietary management of idiopathic non-tropical sprue.

17. Useful in the management of diabetic diets.

18. Valuable in many allergy diets.

19. Belongs among foods useful in certain acute intestinal infections.

20. A protein sparer.

21. Favorably influences mineral balance.

22. Useful in the management of ulcer diets.

23. One of the easiest foods to eat or prepare.

FOR THE NAME OF THIS FOOD, PLEASE TURN THE PAGE

The answer is

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If you would like

1. The authority for any of the statements made on the preceding page . . .

2. Additional information in connection with any of them...

3. The composition of the banana . . .

4. The nutritional story of the banana . . .

5. Information on various ways to prepare or serve bananas.

Please feel free to write to

Director, Chemical and Nutrition Research, United Fruit Company

PIER 3, NORTH RIVER, NEW YORK 6, N. Y.

HIGHLIGHTS OF THE COUNCIL

(Continued from Page 16)

Health Advisory Committee for December 5. Tuberculosis, mental health, local public health units, and urbanization were to be discussed at this citizen's meeting.

- **William Bromme, M.D.,** Detroit, was appointed as MSMS representative to the Second National Conference on Veterans Affairs, January, 1957, Chicago.

- **1957 Michigan Clinical Institute Press Relations Committee:** A. B. Gwinn, M.D., Hastings, Chairman, H. F. Dibble, M.D., Detroit; L. R. Leader, M.D., Detroit; J. J. Lightbody, M.D., Detroit; Ralph W. Shook, M.D., Kalamazoo; and C. L. Weston, M.D., Owosso.

- **Edward M. Vardon, M.D.,** Detroit, presented a Verifax (photographic reproducing machine) to the Michigan State Medical Society, which was accepted with high thanks.

- **B. L. Masters, M.D.,** Fremont, presented report on Study Conference for Chairman of State Rural Health Committees, held at Purdue University October 19-20; the report was received with high thanks.

- **F. E. Ludwig, M.D.,** Port Huron, and **H. A. Towsley, M.D.,** Ann Arbor, were appointed as members of MSMS Liaison Committee with University of Michigan.

- **Legal Counsel Lester P. Dodd** presented opinions on ten questions of legal import.

- **Report of Rheumatic Fever Co-ordinator Leon DeVel, M.D.,** Grand Rapids, was approved with thanks.

- **Public Relations Counsel** presented a report on the Gold Medal Award judging committee; Good Citizenship Get-Out-the-Vote Campaign; Professional Day of the 1957 Michigan Rural Health Conference; Hospital-Community Research Project of Michigan State University; the MSMS public relations library; copies of "Medicine and the Law" film series (AMA); and on the new M.D. placement pamphlet.

- **Committee Reports.** The following committee reports were presented: (a) Formation of American Association of Medical Assistants; (b) Committee on Arbitration, meeting of September 8; (c) Permanent Conference Committee, October 24; (d) Healing Arts Study Committee, October 25; (e) Geriatrics Committee, November 1; (f) Committee to Select Field Secretary, November 7; and (g) Committee Organization Meeting (for Chairmen), November 13.

One DONNAGESIC Extentab gives 10 to 12 hours of steady, high-level codeine analgesia. Rebuilding of effective analgesia with repeated doses is avoided. Patient comfort is continuous.

There is more pain relief in DONNAGESIC Extentabs than in codeine alone — codeine analgesia is potentiated by the phenobarbital present. In addition, phenobarbital diminishes anxiety, lowering patient's reactivity to pain.

DONNAGESIC is safer, too, for codeine side effects are minimized by the peripheral action of the belladonna alkaloids.

extended action—The intensity of effects smoothly sustained all-day or all-night by each DONNAGESIC Extentab is equivalent to, or greater than, the maximum which would be provided by q. 4h. administration of one-third the active ingredients.

Donnagesic™ Extentabs*

extended action tablets of CODEINE with DONNATAL®

once every 10-12 hours and for all codeine uses

	DONNAGESIC No. 1 (pink)	DONNAGESIC No. 2 (red)
CODEINE Phosphate	48.6 mg. (¾ gr.)	97.2 mg. (1½ gr.)
Hyoscyamine Sulfate	0.3111 mg.	0.3111 mg.
Atropine Sulfate	0.0582 mg.	0.0582 mg.
Hyoscine Hydrobromide	0.0195 mg.	0.0195 mg.
Phenobarbital	48.6 mg. (¾ gr.)	48.6 mg. (¾ gr.)

Robins **A. H. ROBINS CO., INC., RICHMOND, VIRGINIA** *Ethical Pharmaceuticals of Merit Since 1878*

*Reg. U. S. Pat. Off., Pat. applied for.

Heart Beats

THE MICHIGAN HEART ASSOCIATION SERVES THE PHYSICIAN

One of the major activities of the Michigan Heart Association is the support of cardiovascular research. The Association has awarded grants totalling $164,000.00 to 27 scientific investigators in Michigan to carry out research studies into the baffling problems of diseases of the heart and blood vessels. The research work is being conducted in 8 medical institutions during the twelve month period ending June 30, 1957.

In addition to its own research program, E. A. Irvin, M.D., Dearborn, President of the Michigan Heart Association, points out that the MHA contributes to the national research support program of the American Heart Association. The national organization has allocated nearly $1,873,000.00 for 311 grants-in-aid and fellowship awards during the same period.

$80,686.00 of the research funds allocated by the Michigan Heart Association have been awarded from the Association's Memorial Fund. This fund was established at the request of many persons who have wanted an opportunity to provide a "living memorial" to the memory of a friend, relative or associate who has been afflicted with heart disease. Memorial contributions are used exclusively for heart research studies. The balance has been allocated from funds contributed to the Association by the people of Michigan through "United" fund raising campaigns in many Michigan communities.

The research investigators receiving funds from the Michigan Heart Association during the current year are as follows:

Dean's Fund.....Wayne University
To enable part-time research investigators of proven ability to devote full-time to cardiovascular research.

Dean's Fund.....University of Michigan
To enable part-time research investigators of proven ability to devote full-time to cardiovascular research.

W. T. Beher, M.D.....Edsel Ford Institute
Study of Cholesterol Metabolism.

J. B. Blodgett, M.D.....Grace Hospital
The Fundamental Problem of Exploring Satisfactory Means of Entrance and Exit through Walls of the Great Vessels and Heart Itself and Problems of Mitral Valve Regurgitation.

D. F. Bohr, M.D.....University of Michigan
A Comparison of Some Basic Characteristics of the Circulatory System in Response to Renal Ischemic, Renoprival and Hormonal (DOCA) Hypertensions.

A. J. Boyle, M.D.....Wayne University
Plasma Colloid Stability in Normal and Atherosclerotic Subjects.

T. M. Brody, M.D.....University of Michigan
Mechanisms of Experimental Heart Failure.

N. E. Clarke, M.D.....Providence Hospital
The Chemotherapy of Rheumatic Fever.

F. D. Dodrill, M.D.....Harper Hospital
Mechanical Heart.

I. F. Duff, M.D.....University of Michigan
Investigation of the Mechanism of Blood Coagulation with Special Reference to the Problem of Thromboembolic Disease.

J. D. Fryfogle, M.D.....Mt. Carmel Mercy Hospital
Arterialization of the Coronary Sinus by Communication to the Left Ventricular Cavity.

F. E. Greifenstein, M.D.....Wayne University
Study of the Contractile Force of the Heart.

Cameron Haight, M.D.....University of Michigan
Temporary Occlusion of a Pulmonary Artery as Means of
(A) Evaluation of the Anticipated Cardiovascular Responses to Pneumonectomy.
(B) A Study of the Pulmonary Vascular Tree by Injection of Contrast Material Beyond the Point of Occlusion.

H. K. Hellems, M.D.....Wayne University
The Investigation of the Effects of Exercise and Commonly Used Cardiovascular Drugs on Myocardial Blood Flow and Metabolism in the Human Subject.

T. B. Hill, M.D.....Kent County Health Department
Incidence of Streptococcal Infections in a Rural School with Study of the Carrier State.

S. W. Hoobler, M.D.....University of Michigan
Atherosclerotic Vascular Disease.

J. J. Jasper, M.D.....Wayne University
The Study of Serum Surface Tension in Atherosclerosis.

C. G. Johnston, M.D.....Wayne University
Prosthetic Replacement or Correction of Valvular Lesions.

J. A. Johnston, M.D.....Ford Hospital
Studies in Rheumatic Fever.

C. R. Lam, M.D.....Henry Ford Hospital
Experimental Cardiovascular Surgery.

B. M. Lewis, M.D.....Wayne University
Diffusion and Distribution Characteristics of the Lung in Heart Failure.

Y. Morita, M.D. and L. T. Iseri, M.D...Wayne University
Metabolic Aspects of Cardiorenal Diseases.

Jan Nyboer, D.Sc., M.D.....Harper Hospital
The Evaluation of Electrical Impedance Plethysmography and Displacement Ballistocardiography.

Prof. F. L. Rights.....Wayne University
Etiology of Acute and Chronic Pericarditis and Myocarditis.

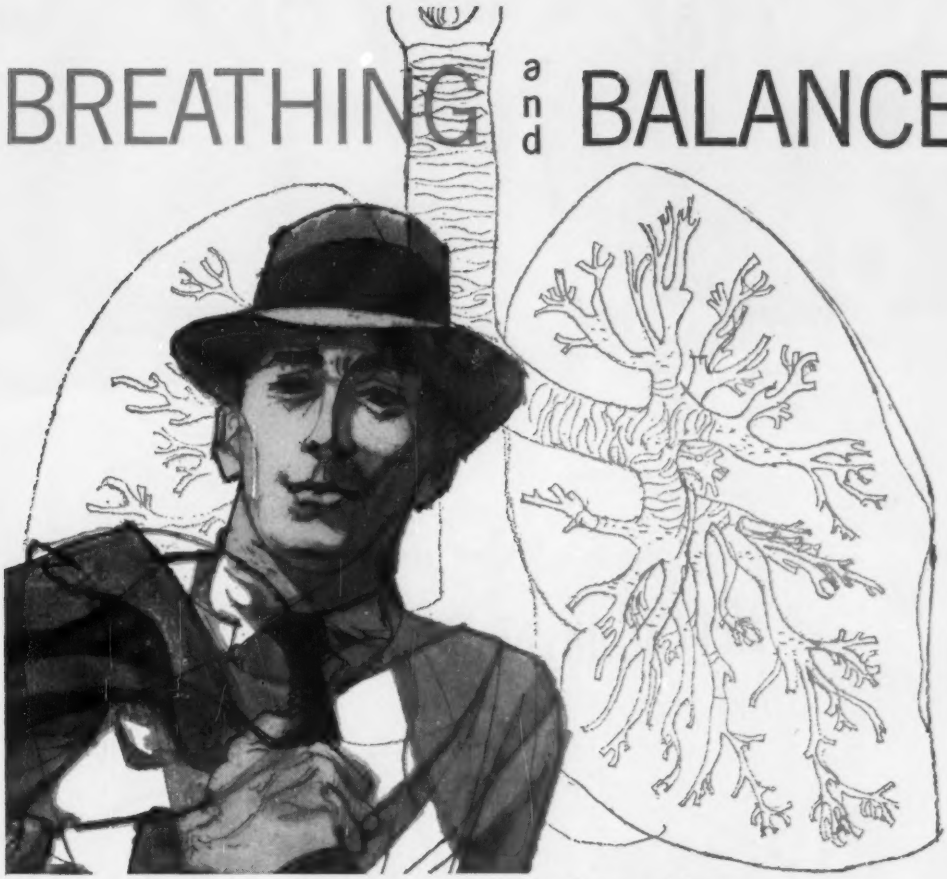
Walter Seegers, M.D.....Wayne University
Blood Coagulation: Purification of Inhibitors and Mechanism of Their Action.

D. E. Szilagyi, M.D.....Henry Ford Hospital
An Investigation of the Use of Plastic Vascular Prostheses in the Replacement of Long and Narrow Arterial Segments.

J. L. Wilson, M.D.....University of Michigan
Investigation of the Effects of Cyanotic Heart Disease and Its Relief on Cerebral Function.

(Continued on Page 32)

BREATHING and BALANCE



in bronchial asthma

Sterane®

brand of prednisolone

whenever corticosteroids are indicated

provides restoration of breathing capacity — Relief of symptoms [bronchospasm, cough, wheezing, dyspnea] is maintained for long periods with relatively small doses.*

minimal effect on electrolyte balance — "in therapeutically effective doses . . . there is usually no sodium or fluid retention or potassium loss."* Lack of edema and undesirable weight gain permits more effective therapy particularly for those with cardiac complications.

Supplied: White, 5 mg. oral tablets, bottles of 20 and 100. Pink, 1 mg. oral tablets, bottles of 100. Both are deep-scored.

*Schwartz, E.: New York J. Med. 56:570, 1956.

PFIZER LABORATORIES, Brooklyn 6, New York
Division, Chas. Pfizer & Co., Inc.

Erythromycin in Treating Pneumonia

A 27-year-old man, a chronic alcoholic, was admitted with a history of an alcoholic spree followed by a cough, greenish sputum and chills and fever.

Physical examination showed a temperature of 104 F. and indicated pneumonia in the right lower lobe. This was confirmed by X-ray. The sputum revealed gram-positive diplococci and blood culture subsequently grew Type VII pneumococci.

The patient was treated with erythromycin, 300 mg. every six hours per os. His temperature dropped to normal by 48 hours and X-ray of the chest revealed considerable clearing by the fourth hospital day. After 10 days hospitalization, the patient was fit for discharge.[1]

First Antibiotics Symposium, we reported the successful treatment with thromycin of *H. influenzae* pneumonia and bacteremia. A second patient with *H. influenzae* pneumonia and bacteremia had a clinical course almost identical to the one previously reported, with cure obtained by treatment with 500 mg. of erythromycin per os every four hours for 14 days.

Of these 132 patients with bacterial pneumonia, 127 (96%) had a good clinical result. One patient with lobar pneumonia had a good initial response but had delayed resolution after treatment.

"Highly Effective in Pneumonia"

In one investigation, 75 adult patients with bacterial pneumonia were treated with erythromycin. In his summary, the clinician reported: "It is concluded that erythromycin is highly effective in the treatment of pneumonia due to gram-positive bacteria."[2]

This, of course, is only one of many reports showing the effectiveness of ERYTHROCIN against coccic infections. You'll get the same good results (nearly 100% in common, bacterial respiratory infections) when you prescribe ERYTHROCIN. Abbott

filmtab®

Erythrocin®

(Erythromycin, Abbott)

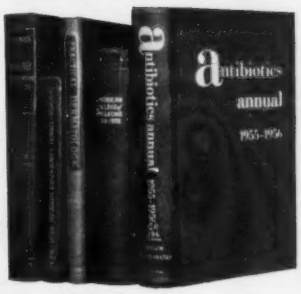
STEARATE

"No Serious Side Effects Occurred"

After a study of 171 patients treated with erythromycin, the investigator wrote: "No serious side effects occurred with prolonged therapy or with doses up to 8 Gm. per day in the severe infections."[1]

Actually, ERYTHROCIN stands on a remarkable record of safety. After four years, there's not a single report of a severe or fatal reaction attributable to erythromycin. In addition, you'll find allergic manifestations rarely occur. *Filmtab* ERYTHROCIN Stearate (100 and 250 mg.), in bottles of 25 and 100. Abbott

® Filmtab—Film-Sealed tablets, Abbott; pat. applied for.



1. Romansky, M.J., et al., Antibiotics Annual 1955-1956, p. 48.
2. Waddington, W. S., Maple, F. C., and Kirby, W. M. M., A.M.A. Archives of Internal Medicine, 1954, p. 556.

701051

THE MICHIGAN HEART ASSOCIATION SERVES THE PHYSICIAN

(Continued from Page 28)

Through MHA and AHA research projects, new findings in the cardiovascular field are made known immediately to the physicians of the state so that they may better serve their patients and their communities.

Professional education is also an important Heart Association objective and a large selection of professional education and information materials are available to the physician with an interest in cardiovascular disease. Through these materials, the Michigan Heart Association endeavors to aid the physician in continuing his self-education in the field of cardiovascular disease, and to assist him in the care of the patient with cardiovascular disease.

These professional materials include films, slides, heart models, three-dimensional cardioviews, phonograph records, clinical charts, pamphlets and books.

The literature runs the gamut from the technical "Nomenclature for Diagnosis of Peripheral Vascular Disease" to a well-written, easily read booklet which the physician can give to his patients, entitled "Have Fun—Get Well."

Some of the film and slide titles include: "Congenital Malformations of the Heart," "Surgical Correction of Mitral Stenosis" and "Roentgenograms of the Heart and Great Vessels."

Another valuable item available to the physician is a set of three Cardiac Kits. These kits consist of slides and phonograph records which explain the slides. A printed explanation is included for more detailed reference, or in case a phonograph is not available. The three subjects covered in the kits are: "The Role of the P-A Film of the Chest in Cardiology" by William R. Christensen, M.D., Professor of Radiology, University of Utah; "The Prevention of Rheumatic Fever" by Gene H. Stollerman, M.D., Assistant Professor of Medicine, Northwestern University; "Functional Pathology of Occlusive Coronary Disease," by Jesse E. Edwards, M.D., Professor of Pathologic Anatomy, Mayo Clinic and Mayo Foundation.

Various publications about cardiovascular disease are regularly available to physicians. They include: "Modern Concepts of Cardiovascular Diseases," "Heart Research Newsletter" and "The American Heart." These publications are sent to all physicians who are members of the Michigan Heart Association as part of their membership. Professional journals available are *Circulation* and *Circulation Research.*

A new two-volume Electracardiographic Test Book, containing photographs of electrocardiograms and questions of electrocardiographic interpretation, is now available. The electrocardiograms from the book are available also on slides.

In addition to all of these professional materials, a vast amount of literature, films and exhibits are available to the physician for his use with patients or the lay public in general. A free booklet on all professional education and information aids available may be secured by writing to the Michigan Heart Association, Doctors' Building, 3919 John R, Detroit 1, Michigan.

REFRESHER COURSE

Plans for a refresher course in "Cardiology for the Family Physician" have been completed by the Michigan Heart Association, in co-operation with Wayne State University and the Michigan Academy of General Practice. The course will consist of five full-day sessions (8:30 a.m. to 5:15 p.m.) from April 22 through April 26, 1957, incorporating both bedside rounds and lectures.

A registration fee of $25.00 will be charged, and the course has been approved for twenty-five hours credit in Category I. For full details, contact either the Michigan Heart Association at the address listed above or Dean, College of Medicine, Wayne State University, 1401 Rivard Street, Detroit.

MICHIGAN MEDICAL SERVICE

(Continued from Page 18)

ation. The President of the Wayne County Medical Society appoints the Board each year. Every effort is made to see that nearly all fields of medicine are represented in the group. Also, should a specific case require medical knowledge beyond the scope of the Board members, advisory consultants are called upon for assistance.

Currently, plans are being considered for developing other Advisory Boards in metropolitan areas across the State through which MMS hopes to gain closer contact with and better understanding by the local medical groups. Kent County Medical Society has appointed an Advisory Board to function as does the Wayne County Board but with attention to cases stemming from Kent and other nearby counties. If work of the Kent County group becomes successful in this effort, it is hoped that other County Medical Societies will establish similar Advisory Boards to Michigan Medical Society.

BIRTH RECORDS

The first year when 100,000 births were reported in Michigan was 1941. Present indications are that the year 1956 will see more than 200,000. The maternal death rate has gone down one half during the same period—63 to 34—a great tribute to the efforts of maternal health committees and concentrated efforts of health agencies.

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both mind
and
muscle

for the average patient in everyday practice

- well suited for prolonged therapy
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- no blood dyscrasias, liver toxicity, Parkinson-like syndrome or nasal stuffiness
- chemically unrelated to chlorpromazine or reserpine
- does not produce significant depression
- orally effective within 30 minutes for a period of 6 hours

Indications: **anxiety and tension states, muscle spasm.**

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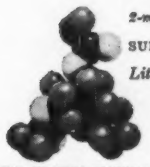
SUPPLIED: *400 mg. scored tablets. Usual dose: 1 or 2 tablets t.i.d.*

Literature and Samples Available on Request



THE MILTOWN MOLECULE

CM-3706-R2

Foundation for Eye Care

Announcement was made November 15, 1956, of the establishment of the National Medical Foundation for Eye Care, a non-profit scientific and educational institution, incorporated in New Jersey. The Foundation has been organized by ophthalmologists of the country to provide American ophthalmology with an agency to present to the public generally and to fellow physicians pertinent information on the care and treatment of the eyes.

Ralph O. Rychener, M.D., Memphis, Tennessee, is president of the Foundation; Edwin Forbes Tait, M.D., Norristown, Pennsylvania, vice president, and Charles E. Jaeckle, M.D., East Orange, New Jersey, secretary-treasurer.

Members of the Board of Trustees, in addition to the above named, are: Alson E. Braley, M.D., Iowa City, Iowa; Frederick C. Cordes, M.D., San Francisco, California; Paul Chandler, M.D., Boston, Massachusetts, J. Spencer Dryden, M.D., Washington, D. C.; Harold F. Falls, M.D. Ann Arbor; Everett L. Goer, M.D., Houston, Texas; Erling W. Hansen, M.D., Minneapolis, Minnesota; A. D. Ruedemann, M.D., Detroit; Barnet R. Sakler, M.D., of Cincinnati, Ohio, and Derrick Vail, M.D., Chicago, Illinois.

In a special statement announcing the Foundation's establishment, Dr. Rychener declared:

"American ophthalmologists have long recognized an urgent need for an organization whose principal function will be to interpret the basic professional and scientific standards of good eye care for the American people, both to our fellow physicians and to the people whom we serve.

"The National Medical Foundation for Eye Care will seek to serve the public interest by helping the people to understand the educational qualifications and the professional functions of physicians specializing in ophthalmology, and the functions of related technical and ancillary personnel who assist them. The Foundation will also endeavor to keep our colleagues in the medical profession informed concerning the problems confronting ophthalmology in its efforts to fulfill its mission as a member of the team of recognized medical specialties serving the American people."

Dr. Rychener revealed that the Foundation is now enrolling its charter membership, and he invited all ophthalmologists and other physicians interested in eye care to become charter members of the Foundation.

Applications are available through Dr. Charles E. Jaeckle, secretary-treasurer, at 136 Evergreen Place, East Orange, New Jersey. The Foundation is establishing an administrative office in New York City, and will make available an Affiliate Membership for persons other than doctors of medicine who are interested in aiding the purposes of the Foundation.

The object and purpose of the Foundation is to advance the public welfare by:

1. Gathering receiving, assembling and studying information relative to eye care.

2. Fostering and/or engaging in investigations and research in all aspects of eye care.

3. Sponsoring studies of educational, socio-economic and scientific factors affecting eye care.

4. Issuing reports and otherwise disseminating information relative to eye care to the general public and to members of the medical profession and ancillary workers.

5. Promoting the conservation of vision and the prevention of blindness through the wider dissemination of knowledge of the eye, its defects, disfunctions and other diseases and their relation to general health.

6. Promoting a more effective utilization of the scientific knowledge of ophthalmology and the other related branches of medicine.

7. Generally performing any act, related to the foregoing, designed to present to the public generally and the medical profession, all pertinent information on the care and treatment of the eyes.

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'Hydrospray' NASAL SUSPENSION

(HYDROCORTONE® WITH PROPADRINE® AND NEOMYCIN)

Anti-inflammatory—
Decongestant—Antibacterial

MAJOR ADVANTAGES: New synergistic anti-inflammatory, decongestant and antibacterial formula. High steroid content assures effective response.

Topically applied hydrocortisone in therapeutic concentrations has been shown to afford a significant degree of subjective and objective improvement in a high percentage of patients suffering from various types of rhinitis. HYDROSPRAY provides HYDROCORTONE in a concentration of 0.1% plus a safe but potent decongestant, PROPADRINE, and a wide-spectrum antibiotic, Neomycin, with low sensitization potential. This combination provides a three-fold attack on the physiologic and pathologic manifestations of nasal allergies which results in a degree of relief that is often greater and achieved faster than when any one of these agents is employed alone. **INDICATIONS:** Acute and chronic rhinitis, vasomotor rhinitis, perennial rhinitis and polyposis.

SUPPLIED: In squeezable plastic spray bottles containing 15 cc. HYDROSPRAY, each cc. supplying 1 mg. of HYDROCORTONE, 15 mg. of PROPADRINE Hydrochloride and 5 mg. of Neomycin Sulfate (equivalent to 8.5 mg. of neomycin base).

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REFERENCE: 1. Silcox, L. E., *A.M.A. Arch. Otolaryng.* 60:431, Oct. 1954.

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in antibiotic therapy...

multi-spectrum†
synergistically
strengthened

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†the antimicrobial spectrum of tetracycline extended and potentiated to include even those strains of staphylococci and other pathogens resistant to previously employed antibiotic therapy; and to provide

1. a new maximum in therapeutic efficacy

2. a new maximum in protection against resistance

3. a new maximum in safety and toleration

Capsules: 250 mg. (oleandomycin 83 mg., tetracycline 167 mg.)

Pfizer *World leader in antibiotic development and production*

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plus a new maximum in palatability... *now available with new mint-flavored*

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OLEANDOMYCIN TETRACYCLINE

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A savory mint flavor that adds the further certainty of acceptability to antibiotic therapy, particularly for that 90% of the patient population treated in the home or office where sensitivity testing may not be feasible, and where pleasant flavor can make the difference between prescription adherence and laxity.

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is available in 2 oz. bottles containing 1.5 Gm. of Sigmamycin (oleandomycin 500 mg., tetracycline 1 Gm.). When reconstituted each 5 cc. teaspoonful contains 125 mg. of Sigmamycin (42 mg. of oleandomycin as the phosphate salt with tetracycline amphoteric equivalent to 83 mg. of tetracycline hydrochloride).

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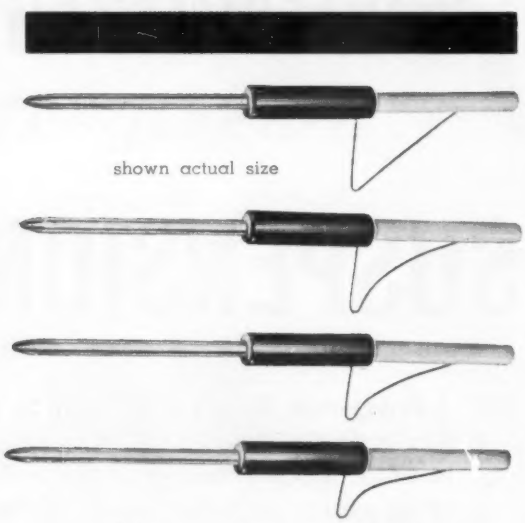

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**Described in his paper which will be sent on request*

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PREVENTION OF RHEUMATIC FEVER

Thirty-three persons died in Michigan in 1955 from rheumatic fever and 849 from chronic rheumatic heart disease, according to information from the Vital Statistics Division, Michigan Department of Health. This is a rate of 122 per million per year, out of a total death rate of approximately 7,000 per million—one death in sixty.

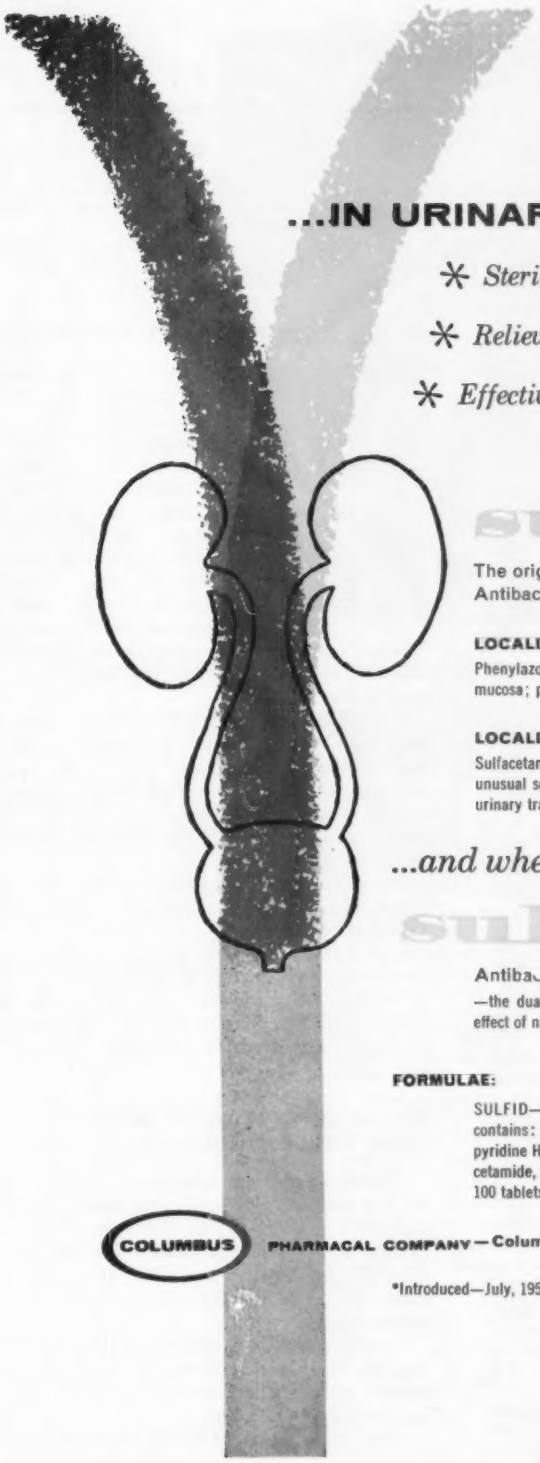
A report of two years' experience with a five-year study of 400 children receiving prophylaxis at Irvington House, which was made to the American Heart Association in Cincinnati on October 29, 1956, would indicate that prophylaxis still leaves much to be desired. Ninety-five streptococcal infections were discovered by throat culture in eighty-seven of the patients, the rate of incidence being one in six patient years. Thirteen recurrences of acute rheumatic fever, representing 15 per cent of those who had one or more streptococcal infections, occurred in spite of prophylaxis, and the recurrence rate for the entire group was one per forty-four patient years.

By method of prophylaxis, there were thirty-six streptococcal infections and nine rheumaitc fever recurrences among children who had received 200,000 units of penicillin orally one-half hour before breakfast, forty-four streptococcal infections and four rheumatic fever recurrences among the group receiving sulfadiazine, 1.0 grams daily in a single dose, and fifteen streptococcal infections and no rheumatic fever recurrences in the group receiving 1.2 million units of benzathine penicillin G intramuscularly at monthly intervals.

The Rheumatic Fever Control Committee, Michigan State Medical Society, recommends prophylaxis of one of the above types for duration of life or until newer knowledge makes the method obsolete. The Michigan Department of Health provides benzathine penicillin G for anyone upon requisition, and the Michigan Crippled Children Commisison provides payment of a fee from trust funds for its administration to children who have been the subject of a court order under the Crippled or Afflicted Children's Acts, upon the request of their family doctor of medicine.

ROBERT E. FISHER, M.D.
Medical Co-ordinator
Rheumatic Fever Program

Of the total AMA budget, not more than 2.5 per cent is spent on legislative efforts. The breakdown on spending: 3 per cent to reserves, 9 per cent to supply members with information, 19 per cent for public information, 6 per cent for socioeconomic activities, 60 per cent for publication of journals and other scientific activities, leaving only 3 per cent for Washington Office, Law Department, and legislative activities combined.



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Antibacterial • Analgesic

LOCALIZED MUCOSAL ANALGESIA

Phenylazo-diamino-pyridine HCl—acts solely on the urogenital mucosa; provides prompt relief from burning, pain and frequency.

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Sulfacetamide—eliminates mixed infections rapidly because of its unusual solubility in acid urine common to bacterial invasion of the urinary tract. No renal damage, concretions or anuria.

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Antibacterial • Analgesic • Antispasmodic

—the dual activity of SULFID with the well-known antispasmodic effect of natural belladonna alkaloids.

FORMULAE:

SULFID—Each coated tablet contains: Phenylazo-diamino-pyridine HCl, 50 mg. and Sulfacetamide, 250 mg., in bottles of 100 tablets.

SULFID B-A—Each coated tablet contains the SULFID formula with natural belladonna alkaloids, 0.065 mg., in bottles of 100 tablets.

COLUMBUS PHARMACAL COMPANY—Columbus 16, Ohio

*Introduced—July, 1954

PR REPORT

THE 1957 LEGISLATURE AND HEALTH

As forecast in the December issue of THE JOURNAL MSMS, the Legislature came to Lansing on January 9, appointed officers, organized committees and settled down for what appears to be a six-month session. If recent pronouncements from the Governor and key legislative leaders are borne out, medical care, public health and general welfare will be foremost on the lawmakers' agenda.

The 1956 House of Delegates, recognizing that a changing world needs new and amended laws, recommended action by the Legislature relating to psychotherapy, Wayne State University College of Medicine (expanded teaching facilities), regulation of ambulance operation, and more civil defense funds.

The MSMS Legislative Committee (L. A. Drolett, M.D., Chairman) met in Lansing, January 10, to finalize these recommendations into its 1956 program and to review legislation anticipated from other sources, some of it perennial, some new.

Of the hundreds of newspaper clippings that monthly come into the PR department from all parts of the state, two recent ones bear reporting here. In a November editorial, the *Detroit News* states, "We hope that next year's Legislature will give Michigan children the protection of a compulsory immunization law."

This attitude was prompted by the recent disclosure that 17,000,000 perishable doses of Salk vaccine were going begging and by the November diphtheria outbreak in Detroit. While the editorial deals primarily with polio and diphtheria, the tenor of the article indicates that *all* immunizations are desired on a compulsory basis. A factor not discussed was whether this all-inclusive program would be paid for by the state, the federal government or by the individual family head who today voluntarily protects his own children from the uninoculated carrier.

In the same week, the *Battle Creek Enquirer and News* editorially takes cognizance of findings and recommendations of the Governor's Study Commission for the Aged and a Legislative Advisory Council on Problems of the Aging. Here is what the editorial said:

"The legislative group, in a public hearing in Lansing, took note of demands for state aid in the fields of *housing* and *employment*. The Governor's Commission recommended that state aid be given the aged for *medical care, including glasses, hearing aids and dentures.*

"How much dependence and separate maintenance should government provide? How much even of security? In our free enterprise system, the more free enterprise and private initiative the better.

"Study sponsored by government? Excellent. Care for needy cases by government? Of course. But taking over the lives of the elderly with public housing projects, state medical care and government-made employment? Certainly not.

"The Legislature can help make older lives more meaningful. It also has an obligation to do so in a practical manner."

NEW FIELD SECRETARY APPOINTED

John K. Pardee, East Lansing, has been named to the public relations staff of MSMS, replacing Warren F. Tryloff in the Detroit office, who was transferred to the executive office in Lansing in December. As Field Secretary, he will co-ordinate liaison between the State Society and the county medical societies in southeastern Michigan and the "thumb" area and will schedule the radio and television public service activities for MSMS in that part of the state.

Mr. Pardee, a political science graduate of Michigan State University, comes to the State Society with a wide experience in the health, insurance and public relations fields. "Jack" now lives in East Lansing with his wife (an MSU dietitian) and their two children and is a member of Peoples Church there.

His fraternal associations include the Masons, Lions, Sigma Chi, Alpha Phi Sigma and the American Legion.

Mr. Tryloff is being promoted after two and a half years in Detroit to become Associate Public Relations Counsel, succeeding A. DeWitt Brewer who resigned in August to become a Vice President with the Mt. Clemens Federal Savings and Loan.

ANOTHER OFFICE OF MEDICAL EXAMINER ESTABLISHED

Members of the Dickinson County Medical Society and county morticians worked together in successful support of the November 6 referendum in that county which abolished the office of county coroner and created the office of county medical examiner. The measure was adopted by a three-to-one margin.

The question was placed on the ballot by action of the County Board of Supervisors at the request of morticians, who later sought and gained medical society support.

Until 1953, only Oakland, Genessee and Kent

(Continued on Page 42)

Tastiest way to dissolve sore throat symptoms

TROCHES

'HYDROZETS'

(HYDROCORTISONE-BACITRACIN-TYROTHRICIN-NEOMYCIN-BENZOCAINE TROCHES)

Adult or juvenile, your patients with sore throats will welcome a course of HYDROZETS. These newest Merck Sharp & Dohme troches offer anti-inflammatory, anti-infective and analgesic properties that promptly alleviate distressing mouth or throat irritation whether caused by infection, mechanical injury or allergic reaction. And HYDROZETS taste so good, it's hard to believe they're medicine.

Formula: Each HYDROZETS Troche contains—2.5 mg. 'HYDROCORTONE' to reduce pain, heat and swelling; 50 units Zinc Bacitracin, 1 mg. Tyrothricin and 5 mg. Neomycin Sulfate to combat gram-positive and gram-negative bacteria; and 5 mg. Benzocaine for rapid soothing analgesia.

Other indications: As adjunct therapy in aphthous ulcers, acute and chronic gingivitis and Vincent's infection.

Supplied: Vials of 12 troches.

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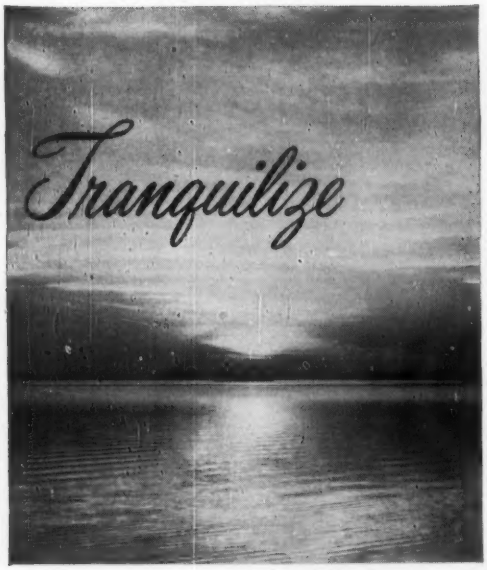

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ACETYLCARBROMAL TABLETS

- Proved safe and effective by 6 years' clinical use.
- Soothes the central nervous system, produces calmness without hypnosis.
- Non-toxic, non-cumulative, non-addicting, no known contraindications.
- Does not impair mental or physical function.
- **Orally effective within 30 minutes for sustained action up to 6 hours.**
- Economical.

Indications: Tension, nervousness, anxiety and muscular spasm.

Supplied: White round tablets Acetylcarbromal 5 gr. in bottles of 100, 1000.

Write for samples and literature

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BLUE SHIELD IS FOR EVERYBODY

In creating and sponsoring Blue Shield, the doctor has triggered a popular movement that won't be stopped until every last potential member is enrolled in a pre-payment plan. For your Blue Shield Plan has not only sold itself—it has sold the American people on the *idea* of security against the economic consequences of unpredictable medical needs.

In ten brief years, Blue Shield enrollment has burgeoned from less than 2 million to more than 37 million people, and about 45 million more have bought some form of cash indemnity coverage for medical-surgical expense through private insurance companies.

While the job of providing voluntary medical care protection to the entire American people is about half done, the demand for this protection is practically universal.

Studies have shown that people in the lowest income brackets are not enrolled in as large proportions as those in the medium income groups. Enrollment among the aged, the self-employed and the rural population is also under par.

Blue Shield's purpose is to help the profession meet its responsibility to the *entire* community, and the Plans are now giving particular attention to these segments of the population whose potentialities for profitable underwriting do not generally appeal to insurance companies operated for private profit.

It's no longer a question whether people are going to have voluntary prepayment for medical care. The real question, today, is whether Blue Shield can do the job satisfactorily and in good time.

And the answer lies with the doctor. American medicine has accomplished a modern miracle in the achievements of Blue Shield to date. The job that remains to be done will require as much imagination, as much bold action and devotion to the task as was needed to get Blue Shield off the ground ten years ago. To do this job, Blue Shield needs the help and guidance of every American physician.

ANOTHER OFFICE OF MEDICAL EXAMINER ESTABLISHED

(Continued from Page 40)

Counties, under a special law, had been permitted to establish a county medical examiner system. After passage of the State Medical Examiner Law that year, at the urging of MSMS, it became possible for other counties to adopt this system if voters approved the local change.

Since January 1, 1954, when the law took effect, Wayne, St. Joseph, Allegan, Wexford, Ottawa, Hillsdale, Van Buren and Marquette Counties have adopted the new system.

INCREMIN*

LYSINE-VITAMIN SUPPLEMENT LEDERLE

Specify INCREMIN TABLETS to stimulate appetite in your problem-eater, underweight, or generally below-par patients of all ages.

INCREMIN TABLETS are highly palatable, caramel flavored. May be orally dissolved, chewed, or swallowed. Dosage only 1 tablet daily.

Each INCREMIN TABLET *contains:*

l-Lysine	300 mg.
Vitamin B_{12}	25 mcgm.
Thiamine (B_1)	10 mg.
Pyridoxine (B_6)	5 mg.

(INCREMIN Drops contain 1% alcohol)

Remember INCREMIN DROPS. Same formula. Cherry flavor. Can be mixed with milk, milk formula, or other liquid. In 15 cc. polyethylene dropper bottle. *Dosage:* 0.5 to 1 cc. (10-20 drops) daily.

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*Reg. U. S. Pat. Off.

severe asthma

is usually aggravated
and prolonged
by a strong emotional overlay

In one study, 'Thorazine' relaxed and improved 11 of 12 patients within one hour after injection . . . in one case "appeared to be life-saving."[1]

'Thorazine' promptly alleviates the emotional stress which may precipitate, aggravate or prolong an asthmatic attack. It enables the patient to sleep, yet does not depress respiration.

Available: Ampuls, Tablets, Syrup (as the hydrochloride), and Suppositories (as the base).

Smith, Kline & French Laboratories, Philadelphia

1. Ende, M.: Am. Pract. & Dig. Treat. 6:710 (May) 1955.

*T.M. Reg. U.S. Pat. Off. for chlorpromazine, S.K.F.

THORAZINE*

one of the fundamental drugs in medicine

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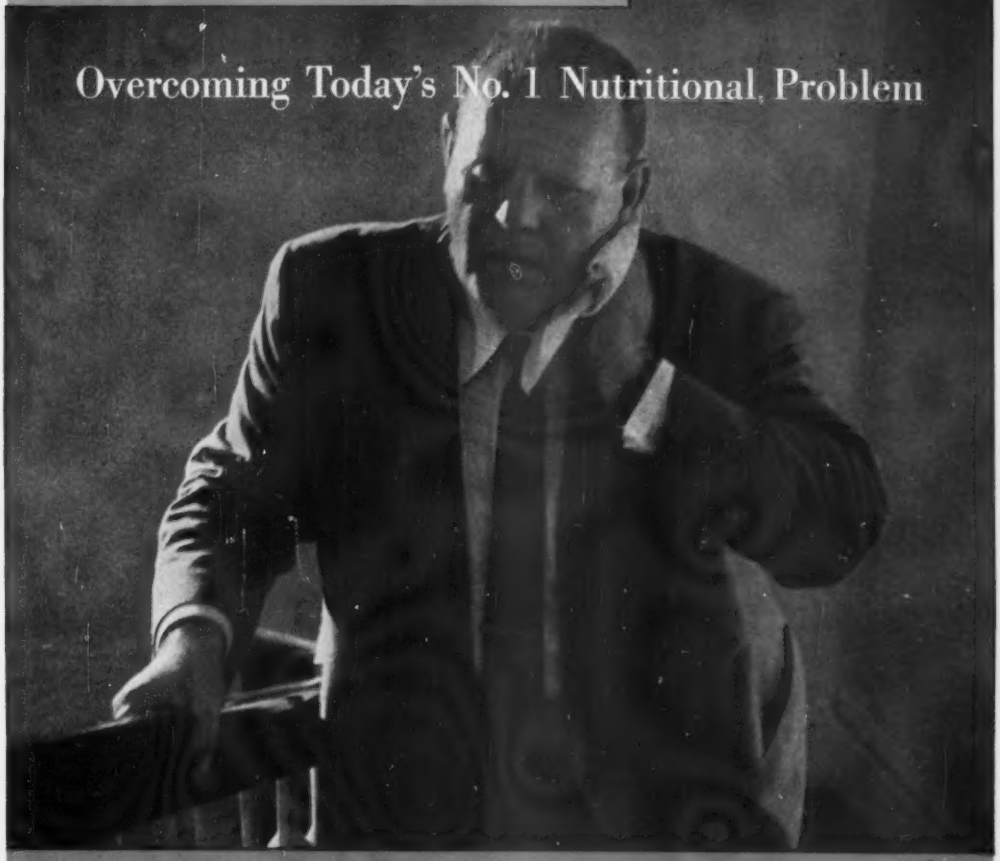

Knox "Choice of Foods" Diet Can Help Your CARDIAC Patients Lose Weight Successfully

1. Color-coded diets of 1200, 1600 and 1800 calories are based on nutritionally-sound Food Exchanges.[1]

2. Easy-to-use Food Exchanges (referred to in the Knox booklet as Choices) eliminate calorie counting by patient.

3. Diets promote accurate adjustment of caloric levels to the special needs of the patient yet allow each individual considerable latitude in the choice of foods.

4. More than six dozen appetizing, low-calorie recipes are presented on the last 14 pages of each diet booklet.

1. The Food Exchange Lists referred to are based on material in "Meal Planning with Exchange Lists" prepared by Committees of the American Diabetes Association, Inc., and The American Dietetic Association in cooperation with the Chronic Disease Program, Public Health Service, Department of Health, Education and Welfare.

Chas. B. Knox Gelatine Co., Inc.
Professional Service Dept. SJ-21
Johnstown, N. Y.

Please send me ..... dozen copies of the new illustrated Knox Reducing booklet based on Food Exchanges.

Your Name and Address

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Striking relief from nausea of pregnancy

'MAREDOX'

brand Cyclizine Hydrochloride and
Pyridoxine Hydrochloride

Just one tablet a day, on rising or at night, restores the nausea-free status to most pregnant women.

Each tablet of 'Maredox' contains:
'Marezine'® brand
Cyclizine Hydrochloride . . . . . 50 mg.
Pyridoxine Hydrochloride . . . . . 50 mg.

BURROUGHS WELLCOME & CO. (U. S. A.) INC., Tuckahoe, New York

Say you saw it in the Journal of the Michigan State Medical Society

external eye conditions consistently respond to...

METIMYD

Ophthalmic Suspension

(prednisolone acetate and sulfacetamide sodium)

Ointment with Neomycin

(prednisolone acetate and sulfacetamide sodium with neomycin sulfate)

blepharitis "responded dramatically to both the drop and ointment form of therapy"†

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acute, infectious, gram-positive conjunctivitis 38 of 42 cases "subsided within four to seven days. . . ."†

episcleritis "responded successfully to topical Metimyd. . . ."†

marginal ulcers "completely cleared in 24 hours"†

†Abrahamson, I. A., Jr., and Abrahamson, I. A., Sr.: Am. J. Ophth. *42*:482, 1956.

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METIMYD,® brand of prednisolone acetate and sulfacetamide sodium.

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when infection
strikes the respiratory tract . . .

ILOTYCIN

(Erythromycin, Lilly)

provides singularly effective antibiotic therapy because

- Virtually all gram-positive organisms are sensitive
- Allergic reactions following systemic therapy are rare
- Bactericidal action kills susceptible organisms
- Normal intestinal flora is not appreciably disturbed

Dosage: *The usual adult dose is 250 mg. every six hours.*

Available *in specially coated tablets, pediatric suspension, drops, ointments, and I.M. and I.V. ampoules.*

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The JOURNAL

of the Michigan State Medical Society

Issued Monthly Under the Direction of The Council

VOLUME 56 JANUARY, 1957 NUMBER 1

Clinical Evaluation of Sintrom (G-23350), A New Oral Anticoagulant

By J. A. Polhemus, M.D., W. S. Wilson, M.D., P. W. Willis III, M.D., J. R. Gamble, M.D., D. R. Griffin, M.D., P. E. Hodgson, M.D., and I. F. Duff, M.D.
Ann Arbor, Michigan

ALTHOUGH anticoagulants are of definite therapeutic value in a variety of conditions, the ideal agent has yet to be found. Wright[7] has defined the ideal anticoagulant as having the following properties:

1. Therapeutically active orally or parenterally without untoward reactions.
2. Rapid action.
3. Predictable response to a given dosage in a patient and between different patients.
4. Prompt termination of its action after discontinuance of the drug or after the administration of a nontoxic antagonist.
5. The activity of the drug can be determined by a simple test.

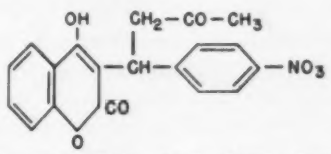
The purpose of this report is to present our experience with Sintrom (G-23350), an oral anticoagulant, and to compare it with the ideal anticoagulant and with anticoagulants which have been in use for some time.

Sintrom, nitrophenyl acetyl-ethyl-4-oxycumarin (Fig. 1) is a member of the cumarin series.

From the Departments of Internal Medicine and Surgery of the University of Michigan Medical School. This study was assisted by grants-in-aid from the Michigan Heart Association and the H. R. Rackham School of Graduate Studies of the University of Michigan. Financial support and Sintrom were also generously supplied by Geigy Pharmaceuticals. Supplies of Mephyton were made available through the courtesy of Merck & Co., Inc.

Presented on Heart Day, Michigan Clinical Institute, Detroit, March 8, 1956. Heart Day was supported by the Michigan Heart Association.

It is a stable compound supplied in 4 mg. scored tablets which are odorless and tasteless and which are administered without difficulty.



SINTROM, NITROPHENYL ACETYL-ETHYL-4-OXYCOUMARIN

Fig. 1.

Extensive animal experimentation[2] has shown Sintrom to be effective in lowering the prothrombin level and to be free of toxicity even after continuous administration for two to three months. Reports from European clinics[3] indicate that this drug is effective in man and is free of untoward reactions.

Sintrom was given to seventy patients, fifty-two of whom had a normal pretreatment prothrombin concentration (80 per cent or above—Quick method) and are therefore suitable for purposes of comparison with results obtained in other patients treated with indandione derivatives as Dipaxin, Hedulin or Indon (PID) and cumarin derivatives as Dicumarol and Tromexan.

Diagnoses of the patients receiving Sintrom are listed in Table I.

TABLE I.
DIAGNOSES OF PATIENTS TREATED WITH SINTROM

Diagnosis	Number of Patients
Thrombophlebitis—without emboli	
Spontaneous	16
Postoperative	5
Carcinoma	4
Pulmonary emboli	
Associated with thrombophlebitis	5
Without apparent thrombophlebitis	2
Myocardial infarction	13
Basilar artery thrombosis	1
Congestive heart failure (prophylactic)	6
Total	52

dose or the total amount of Sintrom required to reduce the prothrombin concentration to the therapeutic levels (less than 30 per cent) regardless of time was 58 mg. The average patient reached therapeutic levels in two and one-third days. Maintenance dosage, usually started on the third or fourth day of treatment, ranged between 6 to 16 mg. with an average of 11 mg. daily. The maintenance dose was found to vary greatly from patient to patient and in the same patient from day to day.

TABLE II. COMPARISON OF THE RESULTS OBTAINED WITH SINTROM, DIPAXIN, PID, DICUMAROL AND TROMEXAN

	Sintrom	Dipaxin	PID	Dicumarol	Tromexan
Patients treated (normal initial prothrombin)	52	64	133	122	50
Mean effective dose	58 mg.	63 mg.	685 mg.	646 mg.	3120 mg.
Therapeutic effect achieved:					
Within 24 hours	2%	5%	18%	14%	12%
Within 48 hours	60%	67%	95%	55%	82%
Average (days)	2.3	2.3	1.3	2.3	2.1
Average days to recover to 40% or above	1.5	4.1	1.5	5.0	2.5
Incidence of prothrombin:					
Escape above 30%	81%	38%	17%	37%	90%
Fall below 10%	27%	10%	10%	15%	20%
Incidence of bleeding	17%	11%	6.5%	11%	9%
Total patients treated	70	104	200	303	100

All patients were evaluated before anticoagulant therapy by members of the anticoagulant team who then followed the patients daily and determined the amount of the drug to be given. A base line prothrombin concentration was obtained prior to instituting therapy and daily prothrombin determinations (Quick method) were made while the patient continued to receive Sintrom and following its discontinuance until the prothrombin concentration had risen above 40 per cent. The aim of therapy was to maintain the prothrombin concentration between 20 per cent (33 seconds) and 30 per cent (22 seconds) of normal. A single daily dose was usually employed, as no difference was noted when the drug was given twice daily. When the clinical condition warranted an immediate effect on the blood-clotting mechanism, intravenous and/or subcutaneous Heparin was given.

The results obtained with Sintrom and the previously evaluated anticoagulants are recorded in Table II.

The usual initial dose of Sintrom was 28 to 32 mg. followed by 16 to 24 mg. on the second day. The larger doses were usually given to patients of greater weight, but no definite relationship between dosage and body weight was observed. The average total dose for the first forty-eight hours was 46.5 mg. The mean effective

After the therapeutic range had been achieved, forty-three of the fifty-two patients, or 81 per cent, escaped at one time or another above the 30 per cent level, and fourteen patients, or 27 per cent, were below the 10 per cent level on at least one occasion. There was a total of 525 days of maintenance therapy during which the prothrombin concentration was above 30 per cent on 143 days, or 27 per cent of the time, and below 10 per cent on eighteen days, or 3 per cent of the time. Following the discontinuance of therapy the average time for the prothrombin concentration to return to above 40 per cent was thirty-six hours.

Bleeding, limited to mild epistaxis and hematuria occurred in nine patients, or 17 per cent. Though this is slightly higher than found with the other agents, the number of patients observed was not large enough to make it statistically significant, and it is doubtful if bleeding is more apt to occur with Sintrom therapy. As noted with other anticoagulants, bleeding usually occurred when the prothrombin concentration was 10 per cent or below. The hypoprothrombinopenia induced by Sintrom was rapidly corrected by oral or intravenous Vitamin K_1 (Mephyton) (Fig. 2).

No evidence of toxicity was noted though therapy was continued in one patient for fifty-three

days. Pre-treatment and post-treatment renal and liver function studies, consisting of creatinine clearances, urinalyses and Bromsulfalein excretions, were performed in two patients without evidence of change. No absolute resistance to Sintrom was noted.

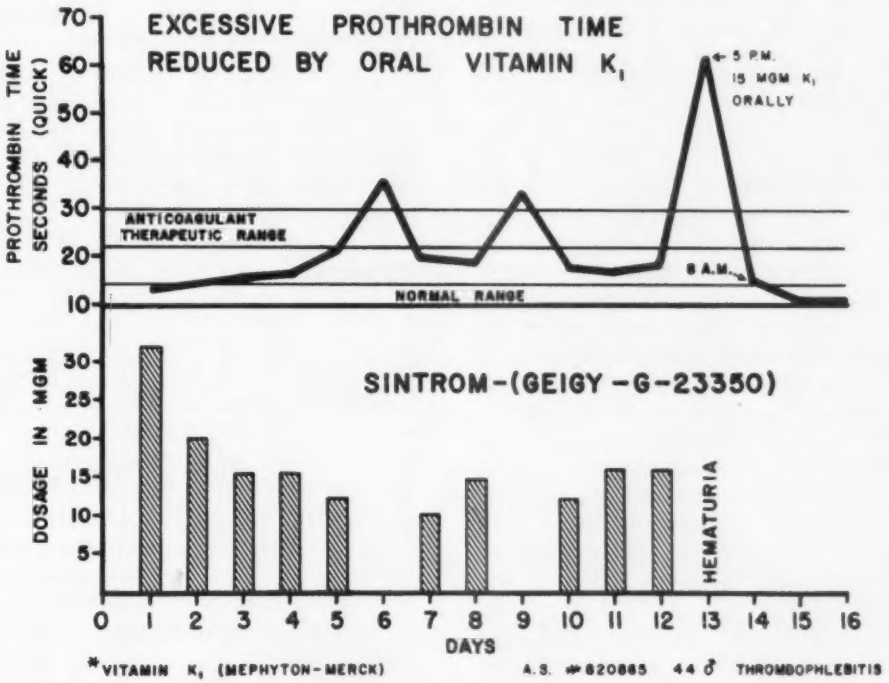


Fig. 2. The excessive prothrombin time resulting from Sintrom was rapidly reversed by 15 mg. of vitamin K_1 orally with prompt cessation of hematuria.

In addition to daily Quick one-stage prothrombin determinations, several patients had simultaneous prothrombin evaluations by the Owren one-stage P and P method,[4] the Ware modification of the Owren one stage method[5] and the two stage method of Ware and Seegers.[6] As previously reported by Duff,[1] when the prothrombin level was within therapeutic range (10 to 30 per cent) by the Quick one-stage and two-stage methods, the corresponding values by the Owren and Ware methods were definitely below the recommended safe level. The Quick method of prothrombin determination, which is the simplest and most widely used, though not specific, was found to be satisfactory for control of Sintrom.

Two patients had daily Factor V (Proaccelerand) and Factor VII (Proconvertin) determinations. A fall in Factor VII activity was noted to parallel the decrease in prothrombin activity as reflected by the one stage (Quick) and two stage methods. No significant change in Factor V could be detected.

Sintrom was the most potent anticoagulant evaluated, milligram for milligram. Though it probably is more rapid in action than Dicumarol and similar to Dipaxin, it is not as rapid as Tromexan and PID. The return to normal prothrombin levels following the discontinuance of drug administration would appear to be as rapid with Sintrom as with any of the other anticoagulants. Unfortunately in our experience there does not seem to be a uniform response to a specific dosage from patient to patient nor in the same patient. This characteristic makes selection of a maintenance dose difficult and probably accounts for the high incidence of escape from therapeutic levels.

Summary

1. Sintrom, an oral anticoagulant, was given to seventy-two patients. The results in fifty-two of

(Continued on Page 56)

Diuretics in the Treatment of Congestive Heart Failure

By Yoshikazu Morita, M.D.
Detroit, Michigan

ONE of the cardinal manifestations of congestive heart failure is edema. The raw materials for this edema, chiefly sodium and water, are provided by the abnormal retention, by the kidney, of these substances. This retention is due to two factors: decrease in the glomerular filtration rate, and increase in the tubular reabsorption of sodium and water. These two factors are more or less operative in all cases of congestive heart failure, and are secondary to the failure of the heart to maintain an adequate circulation.

The primary effort in the therapy of congestive heart failure, then, should be directed toward the correction of the damaged pump. Unfortunately, the types of heart disease for which we have a specific cure are few, indeed. Commissurotomy for mitral stenosis, thiamin for beriberi heart disease, subtotal thyroidectomy or therapeutic doses of radioactive iodine for thyrotoxic heart disease are examples of specific corrective measures. For the majority of cases of heart failure, digitalis is a nonspecific but highly effective medication to improve the efficiency of the failing myocardium. These specific measures plus digitalis, then, constitute the primary weapons against congestive heart failure; their use usually improves the circulation sufficiently to reverse the mechanisms which caused the edema, resulting in diuresis.

Frequently, however, a direct approach to the elimination of the excess sodium and water is made. This may be accomplished in two ways: reducing the intake of sodium, and promoting the excretion of sodium and water. The absorption of sodium into the body may be reduced by low-sodium diets and by the use of cation-exchange resins. The increased removal of edema fluid may be accomplished by mechanical means, such as abdominal paracentesis,[1] or by diuretics, which promote increased renal excretion of edema fluid. In most patients, diuretics permit a more rapid recovery from congestive heart failure than would be possible without their use, and in some patients, diuretics are necessary if any improvement at all is to be noted. The diuretics which are commonly used in the therapy of congestive heart failure are shown in Table I.

TABLE I. COMMONLY AVAILABLE DIURETICS IN THE TREATMENT OF CONGESTIVE HEART FAILURE

I.	Organic mercurials
	A. Parenteral
	B. Oral
II.	Acetazoleamide (Diamox)®
III.	Aminometramide (Mictine)®
IV.	Ammonium chloride
V.	Aminophylline

The injectable organic mercurial preparations are the most effective of the diuretics. Oral mercurial compounds, Diamox® and Mictine,® are less effective but useful compounds, since they may be administered by mouth. Ammonium chloride and aminophylline are not very potent diuretics in themselves, but are important adjuncts in the optimal use of mercurials, and will be discussed more in detail below.

Organic mercurial preparations act by depressing the reabsorption of chloride, sodium, and water by the renal tubules, thereby producing an increase in the urinary excretion of these ingredients of edema. The exact biochemical locus of action is still in doubt.[2,3] It usually promotes a greater excretion of chloride than of sodium;[4,5] the result frequently is a depletion of chloride from the body. There is also an increased excretion of acid in the urine. These two actions lead to the development of hypochloremic alkalosis, which is the most common electrolyte disturbance produced by the use of a mercurial diuretic. Its recognition is important in that it results in a refractoriness to further injections of the same compound. This refractoriness may be the result of the decrease in the chloride load filtered by the glomeruli,[6] and/or of the shift of intracellular pH toward alkalinity.[7] Correction of this

From the Departments of Medicine, City of Detroit Receiving Hospital and Wayne State University College of Medicine, Detroit, Michigan.

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electrolyte disturbance may be simply made by the administration of ammonium chloride. Enteric coated tablets, in the dose of 2.0 grams four times a day, should be given for two to three days.

A second type of electrolyte disturbance sometimes attributed to the use of mercurials is hyponatremia. The appearance of this condition is usually due in part to other factors, such as markedly restricted salt intake, extrarenal salt loss, and internal shifts of electrolytes, and it is difficult to blame the diuretic alone. Mild hyponatremia of about 125 to 130 mEq. per liter does not usually prevent an adequate response to mercurials, provided the chloride level is not low. Severe hyponatremia of less than 120 milliequivalents per liter may reflect an actual deficit of total body sodium, as may be the case in a patient who has been eating little and receiving frequent injections of mercurials. Physical examination of such a patient would reveal evidence of dehydration and possibly collapse, or of normal hydration. Replenishing the sodium supply may improve the clinical picture almost immediately. The following formula may be used as a guide to determine the amount of sodium to be given to raise the plasma level by a given amount. Six-tenths milliequivalent of sodium should be given for each kilogram of body weight to raise the plasma sodium level by 1 milliequivalent per liter. If it is desired to raise the plasma sodium level in a 70 kilogram man by 10 milliequivalents per liter, 0.6 x 70 x 10 or 420 milliequivalents of sodium should be given. The sodium may be given chiefly as the chloride, bicarbonate or lactate, depending upon the relative deficits of bicarbonate and chloride in the plasma. It is advisable to proceed cautiously when administering large amounts of sodium; an attempt to correct the plasma sodium level completely to normal in one step should not be made. It is suggested that about one-half of the amount needed for complete restitution be given as the first dose. Further doses may be given if a good clinical response occurs, and incomplete correction of the hyponatremia is found. A patient with congestive heart failure, who still has moderate to marked edema and who has severe hyponatremia, probably does not have a deficit of total sodium, but actually has an excess of total body sodium. In the extracellular fluid, the excess of water, however, is relatively greater than the excess of sodium, resulting in hyponatremia. The giving of sodium to such a patient is very much like giving an additional weight for the left hand to a man who is carrying a heavy package in his right hand. The added burden, by restoring better balance, may result in more efficient carrying ability; however, there is the danger that the man may not be able to lift the total load at all! In patients with congestive heart failure, the infusion of hypertonic saline may result in a temporary increase in urinary output of water and sodium; however, usually the net loss of edema is nil.[8] Frequently, patients who develop this type of electrolyte disturbance are critically ill, and the giving of hypertonic saline does not prevent a continuing downhill course.[9] It is possible that in such patients the hyponatremia is a reflection of decreased osmolarity of the intracellular fluid, and therefore not amenable to correction by the addition of sodium to the extracellular fluid. If it has been decided to give sodium to the edematous patient with hyponatremia, the amount of sodium required should be calculated from the above formula. Since water is already present in large excess, the intake of water must be kept at a minimum; the sodium should be given intravenously, slowly, as a hypertonic solution, such as 5.8 per cent saline, which contains 100 milliequivalents of sodium per 100 ml.

A third type of electrolyte disturbance which may develop during mercurial therapy is hypopotassemia. Under certain conditions, mercurials may inhibit the tubular secretion of potassium.[4,10] However, in most patients with congestive failure, there is an increase in potassium excretion. This increased excretion is not very marked in most patients. Hence, in a patient who is eating normally, marked potassium depletion does not occur. Nevertheless, even a modest loss of potassium in a patient who is fully digitalized may lead to cardiac manifestations of digitalis intoxication,[11] such as frequent ventricular premature beats. This is due to the opposing effects which potassium and digitalis exert upon myocardial function.

During the development of congestive heart failure, there is usually a negative potassium balance.[22] In subjects in whom this deficit becomes very large, perhaps due, in part, to poor intake of food, a marked decrease in intracellular potassium occurs. Extracellular sodium may

migrate into the cellular space under such conditions, resulting in hyponatremia. In such cases, the hyponatremia cannot be corrected until the intracellular potassium deficit is remedied.[12]

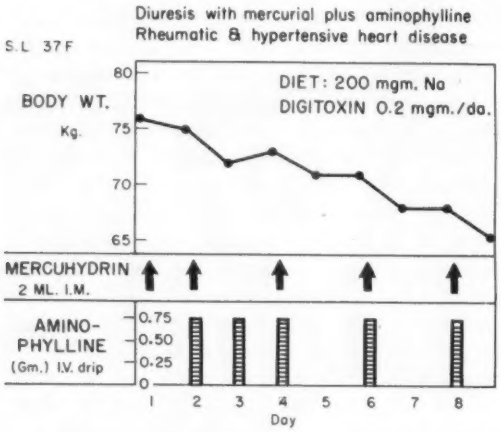

Fig. 1. Diuresis produced by the combined use of a mercurial diuretic plus aminophylline.

Where potassium lack is deemed to be clinically significant, potassium chloride, enteric coated, should be given in a dosage of 2.0 grams three to four times daily until the deficit is corrected.

Before discussing a plan for the use of mercurial diuretics, the value of aminophylline as an adjunct to mercurial diuretics should be discussed. When given parenterally, aminophylline has two effects on the kidney: first, it increases renal plasma flow and glomerular filtration rate,[8] both of which are usually depressed in congestive heart failure; and, secondly, it inhibits tubular reabsorption of sodium. The first is by far the more important factor. Since filtration is the first step in the production of urine, a diminution of this function, such as occurs in congestive heart failure, hinders the removal of sodium and water and, thus, of edema, by the kidneys. Of the diuretics commonly used, aminophylline is the only one which increases glomerular filtration. Figure 1 illustrates the use of this drug. The patient was a woman with hypertensive and rheumatic heart disease, with severe congestive heart failure. It is to be noted that with aminophylline alone or with mercurial alone, there was no loss of edema, as indicated by daily body weight measurements; however, the combination of the two drugs resulted in a good diuretic response repeatedly. The increase in glomerular filtration, brought about by the aminophylline, plus the inhibition of tubular reabsorption of salt and water, accomplished by the mercurial, resulted in diuresis, where either one alone failed.

Table II is a suggested regimen for the use of injectable mercurial diuretic in congestive heart failure; it embodies the principles of its use outlined above.

TABLE II. SUGGESTED REGIMEN FOR PARENTERAL MERCURIAL DIURETIC

I.	2 ml. intramuscularly every third morning.
II.	If response, as measured by increase in urinary volume and/or decrease in body weight is poor, give enteric coated ammonium chloride, 2.0 grams four times a day, for three days preceding each dose of the mercurial.
III.	If the response is still poor, give aminophylline, 0.5 to 1.0 gram, in 300 ml. of 5 per cent glucose in water intravenously over a three-hour period, starting simultaneously with the dose of mercurial.

In more urgent cases, mercurial injections may be given oftener than indicated; however, more frequent injections are more likely to lead to electrolyte disturbances, resulting in refractoriness, and may result in mercurialism if renal function is markedly impaired. Aminophylline need not be given as an infusion, but may be given in one 0.5 gm. dose intravenously about one to two hours after the mercurial. If intravenous injection is not feasible, aminophylline, 0.5 gm. in 2 ml., may be administered intramuscularly together with the mercurial in the same syringe[13]; however, this is not a recommended procedure, since intramuscular injections of aminophylline are painful. Orally administered aminophylline is poorly absorbed, and therefore has little beneficial effect. It should be stressed again that the patient should be at rest, reclinining, for several hours to obtain a maximal glomerular filtration rate and maximal diuresis.

The procedure just outlined is designed for the initial treatment of a patient with congestive heart failure. For maintenance, less strenuous measures may suffice. Many patients may remain edema-free with digitalis, adequate rest, salt restriction, and one of the oral diuretics.

Oral mercurial preparations are not as effective as their injectable counterparts.[14,15] Moreover, there is a higher incidence of side reactions, notably gastrointestinal disturbances, which attend their use.[16] Gastrointestinal manifestations include stomatitis and gingivitis, nausea, vomiting, abdominal pain, and diarrhea. Dermatitis, albuminuria and hematuria also have been reported. Mercurials are also prepared as rectal supposi-

tories. Their efficacy is of the same order as that of the oral diuretics.[23]

Acetazoleamide, or Diamox, is another recently introduced oral diuretic. This interesting compound is an inhibitor of the enzyme carbonic anhydrase, which is found in the cells of the renal tubules. One of the numerous functions of the distal renal tubules is the acidification of urine. This function and the reabsorption of some of the sodium in the tubular urine are intermeshed in an operation which requires carbonic anhydrase for its functioning. In the tubular cell, this enzyme catalyzes the production of carbonic acid from the ever present raw materials, water and carbon dioxide. The carbonic acid, in turn, dissociates to yield hydrogen ion and bicarbonate ion. The hydrogen ion is secreted into the tubular urine in exchange for sodium ion. The operation results in the excretion of acid and the conservation of sodium ion to the body. When Diamox is administered, this enzyme is blocked. The production of carbonic acid decreases and, consequently, the availability of hydrogen ion in the tubular cell is decreased. Exchange of sodium for hydrogen is thereby reduced, allowing more sodium to remain in the tubular fluid. The result is the excretion of increased amounts of sodium and, with it, water. Further, since hydrogen ion secretion is depressed, the urine becomes less acid, and frequently alkaline. A consequence of the use of this compound, therefore, is the production of hyperchloremic acidosis.[17] This is the exact opposite of the electrolyte disturbance produced by mercurials.

In clinical trials,[18,20] Diamox has been found to be a mild to moderate diuretic. It is said to be more effective in failure due to cor pulmonale than in ordinary types of heart failure.[19] The hyperchloremic acidosis produced is usually mild and asymptomatic; however, it will result in refractoriness to the diuretic action of the drug. In order to allow the body to recover from the acidosis and thus again become responsive to the drug, the compound should not be given more often than once every other day. The side effects of the drug in the doses recommended below are mild, and consist of paresthesia of the circumoral area and the extremities.

Aminometramide, or Mictine, is another useful oral diuretic.[21] It acts by inhibition of tubular reabsorption of sodium and water, and no electrolyte disturbance has been reported following its use. Because the side effects are chiefly referable to the gastrointestinal tract, the drug should be given with meals to minimize this. Doses larger than that recommended below will give a high incidence of undesirable reactions; nausea and vomiting were found in 31 per cent of patients receiving 1.5 gm. of Mictine per day.[21] On the basis of preliminary observations, Rolicton,® which is closely related chemically to Mictine, seems to be as effective as, and less likely to cause nausea and vomiting than, Mictine, when 500 mgm. are given three times a day with meals.

Table III summarizes the doses and suggested plan for the use of the oral diuretics discussed.

TABLE III

I.	Mictine®
	200 mg. t.i.d. with meals, every other day
II.	Neohydrin®
	3 to 8 tablets after breakfast, every other day
III.	Diamox®
	250 or 500 mg. every other morning

In general, if possible, all diuretics should be given in the morning, or not later than mid-afternoon, to allow the patients uninterrupted sleep at night. In the case of Mictine, gastrointestinal disturbances dictate administering the drug with meals. With oral mercurials, the larger doses indicated should not be continued indefinitely, since gastrointestinal symptoms of mercurialism are more apt to develop. Furthermore, in patients with elevated blood urea nitrogen or nonprotein nitrogen, there may be an impaired ability to excrete mercury, and mercurial diuretics, oral or parenteral, should not be used in high doses. The importance of bed rest for at least a few hours after administration, to obtain maximal effect, has been stressed above.

Summary

In conclusion, diuretics are important, although secondary, therapeutic measures in the treatment of congestive heart failure. Parenteral organic mercury preparations are the most potent diuretics known. In the absence of severe organic renal disease, mercurials, used with ammonium chloride and aminophylline, as indicated, will produce diuresis in most patients with severe congestive heart failure. The oral diuretics are less effective than injectable mercurials; however, in moderately severe cases, their use may reduce or nullify the requirement for injections. Each of the diuretics must be used with a full understanding of its mode of action and its shortcomings.

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SINTROM, A NEW ORAL ANTICOAGULANT

(Continued from Page 51)

these were compared with those obtained in other patients receiving Dicumarol, Hedulin or Indon (phenylindandione), Dipaxin and Tromexan.

2. On the basis of the mean effective dose, the drug was found to be the most potent of any of those studied.

3. A maintenance dose was difficult to establish which resulted in a high incidence of escape from therapeutic range.

4. Toxicity was not encountered and the incidence of bleeding (17 per cent) was in the general range reported with other anticoagulants.

5. The excessive effect of Sintrom could be rapidly reversed by oral or intravenous Vitamin K_1.

6. A decrease in Factor VII activity paralleled the hypoprothrombinemia produced.

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Interatrial Septal Defect

Course and Surgical Correction

By James B. Blodgett, M.D.
Detroit, Michigan

INTERATRIAL septal defect is an important cardiac anomaly because it usually causes death in early adult life and it is subject to surgical correction. It is one of the most common of the congenital abnormalities of the heart. Gelfman and Levine[1] in studying 453 autopsied cases of congenital heart disease found interatrial septal defect present in 39 per cent of all cases and in 25 per cent of the cases over two years of age. In a clinical study of 1,395 patients with congenital heart disease, Gasul & Fell[2] found interatrial septal defect to be the fourth commonest lesion, occurring in 9.6 per cent of their series.

The life expectancy in interatrial septal defect varies as it does with other congenital cardiac defects, but average life expectancy is between thirty-four[3] and forty[4] years. Death is preceded by a number of years of increasing cardiac disability.

The pathologic physiology is a consequence of the anatomic defect and the associated abnormal hemodynamics. The primary hemodynamic abnormality is an enormous flow of blood from the left atrium to the right. This is referred to as a left to right interatrial shunt. The great quantity of this shunt was demonstrated by Healy, Dow, Sosman and Dexter[5] who calculated the volume of the flow per minute by obtaining the difference between the pulmonary flow and the peripheral flow in liters per minute. The flow through the shunt in their patients was commonly 6 to 8 liters per minute and not infrequently as high as 25 to 28 liters per minute. This large volume of interatrial flow is added to the normal inflow of the right atrium. Consequently, the minute volume flow through the right atrium, the right ventricle, pulmonary vascular system and the left atrium is very large. The left ventricular and arterial flow is reduced in quantity by the interatrial shunt. The increase in pulmonary flow produces the enlargement of the pulmonary vasculature, as seen by x-ray and also produces the vascular pulsation which is occasionally seen, and is known as "hilar dance." The reduced peripheral arterial flow is the cause of the easy fatigue in these patients and the general underdevelopment. It has been shown by Edwards,[6] Dammann,[7] and others, that large increases in volume of pulmonary flow eventually produce obliterative vascular changes which increase resistance and consequently elevate the pulmonary artery pressure. Concomitantly there is elevation in right ventricular **pressure and increased** work for the right ventricle. There follows right ventricular hypertrophy and dilatation and eventual incompetence of both the pulmonary and tricuspid valves. At some stage in this sequence the right atrial pressure rises and clinical signs of peripheral congestive failure ensue. In the late stages, the right auricular pressure may rise to such levels that the volume of the shunt is very much reduced if not completely eliminated and there is occasional *reversal* of the shunt so that blood flows from the right atrium to the left, with the appearance of cyanosis. Death is the ultimate consequence of this pathophysiologic progression.

The anatomic consequence of the interatrial shunt is enlargement of the pulmonary artery and its radicals, enlargement of the right ventricle, the right auricle and left auricle. Apparently, as the atria dilate, the defect in the interatrial septum also enlarges, that is, it is stretched along with the atrial walls and septum. This increases the amount of the shunt. The mitral valve has been commonly found to be abnormally small, but not the seat of pathologic abnormality. The probable reason for this is that since the flow through the mitral valve into the left ventricle has always been small, the valve has not enlarged at the normal rate. As the individual grows, there is greater disproportion between the mitral valve which remains relatively infantile and the interatrial defect which enlarges as the atria dilate. The effect of this is an increasing per cent of left to right shunt.

Dr. Blodgett is Associate Surgeon, Grace Hospital and Assistant Surgeon, Children's Hospital Detroit, Michigan.
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As a means of correction of this anomaly, closure of the interatrial septal defect is obviously necessary. Open heart surgery with inflow occlusion may occasionally be necessary, but for the commoner atrial defects the closed method has proven very safe and effective. The closed method of interatrial repair depends upon a technique developed by Sondergaard, presented by Bjork and Craford.[8] Briefly, the method of Sondergaard depends upon the fact that the posterior portion of the interatrial septum reaches the atrial wall at a point between the vena cava and the right pulmonary veins. Thus, by dissecting up the vena cava away from the pulmonary veins at the hilum of the lung, the dissection is carried essentially into the back portion of the interatrial septum. Once this dissection has been made, sutures can be placed from the outside of the atrium, which can close the septal defect. The needle is guided by the finger introduced into the right atrium through the auricular appendage. Through the septal defect both sides of the interatrial septum can be palpated as the sutures are being placed. These sutures can be placed in a variety of ways and the completeness of the closure can be clearly appreciated by the palpating finger. The closure can be accomplished without interference with the vena caval inflow and should not of course interfere with the AV conduction system, or the outflow of the coronary sinus. Before the closure it is possible to pass the intracardiac finger through the auricular defect and palpate the mitral valve and to palpate any possible tricuspid insufficiency. As the defect is closed the distention of the right atrium becomes noticeably less, and the color of the blood as the finger is withdrawn from the right atrial appendage is dark venous in appearance rather than bright red as when the finger was introduced. We have also noted, in cases where a pulmonary arterial thrill had been palpable, that this has disappeared upon interatrial closure. Suturing and manipulation from the right side of the heart is attended with very little rhythm irregularity and the cardiac function has been well maintained during surgery. Figures 1 and 2 illustrate three methods of suture placement. All start from the Sondergaard dissection. The lower two illustrations in Figure 2 show the method of suture placement devised by Lam[9] which uses a double-ended needle. In cases where the septal wall is thick enough, this method has been very useful.

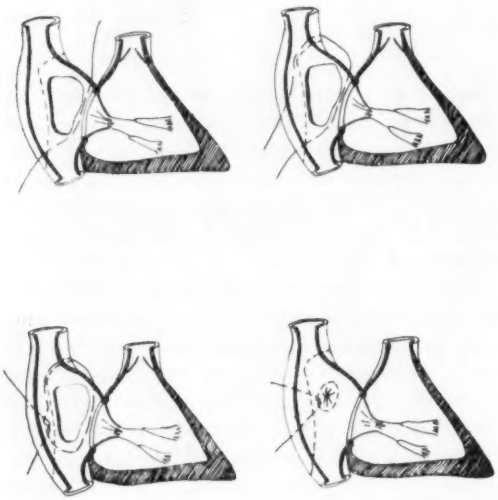

Fig. 1. Interatrial defects; closed methods of repair. The four drawings illustrate the placement of the circumferential suture and the dissection behind the vena cava into the posterior portion of the interatrial septum, which permits closure of the defect by tying the suture.

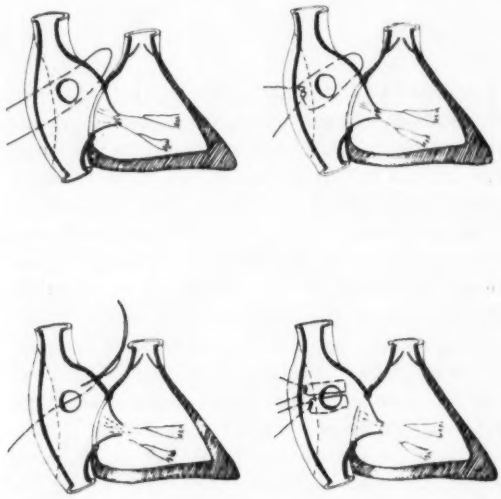

Fig. 2. Interatrial defects; closed methods of repair. Drawings A and B illustrate placement of mattress sutures from the Sondergaard dissection to close the defect. Drawings C and D illustrate the technique of Lam for closing the defect with the double ended needle.

The indication for surgical closure of an interatrial septal defect would appear to be the presence of the defect in any patient who has

not progressed to the stage of such elevated irreversible pulmonary hypertension that operation can produce little or no improvement. Ideally the closure should be effected before the secondary anatomic results of the massive shunt and chamber enlargement have occurred. There is no doubt that the operative procedure is easier and less hazardous when undertaken on the small hearts of children rather than upon the tremendously enlarged hearts of adults. Our present feeling is that parents with children who have interatrial septal defects should be advised to have operative closure for the following reasons:

1. The expectation is that the individual will die before the age of forty without closure.
2. Early operation prevents:
   (a) Progressive enlargement of the interatrial defect.
   (b) Increasing disproportion of the mitral valve and the defect.
   (c) Progressive pulmonary vascular changes and pulmonary hypertension.
   (d) The clinical complications of the disease such as recurrent pneumonia, pulmonary thrombosis, and hemoptysis.
3. The child can regain his normal growth curve.
4. The operation is technically easier and less hazardous in childhood.

Surgery is contraindicated if the pulmonary pressure, as measured by catheterization, is considerably elevated. The reason for this is that irreversible pulmonary vascular changes have occurred and the right heart symptoms will not abate as a result of closure of the defect. Pulmonary hypertension is clinically suggested by signs of right cardiac failure, a very large heart and if the patient is over forty years of age.

Case Reports

The following three cases are presented to illustrate the previous points.

Case 1.—This was a forty-two-year-old woman who had had progressive disability for six years, characterized by breathlessness, fatigue, dependent edema and ascites. She entered the hospital completely incapacitated and was maintained in an oxygen tent. Roentgenogram showed tremendous enlargement of the heart (Fig. 3). Angiography demonstrated trichamber enlargement with a very large pulmonary arterial tree. Catheterization findings by Dr. Harper Hellems showed that there was a left-right shunt of 4.7 liters per minute and that the pulmonary artery pressure was 97/36. Operation was carried out April 19, 1955. At this time a tremendous right auricle was demonstrated. The defect by palpation was felt to be 4 to 5 cm. in diameter. There was definite tricuspid regurgitation. The defect was completely closed with mattress sutures.

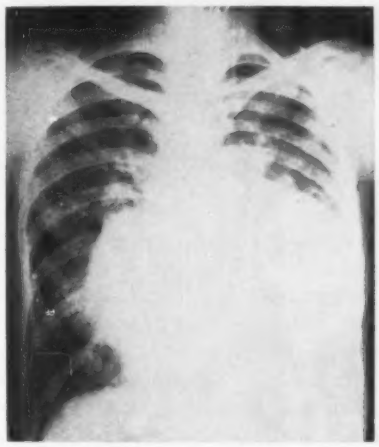

Fig. 3. Case 1. Preoperative chest radiograph.

Following operation the patient was improved. Her respiration was considerably easier. She could be out of her oxygen tent, was up and around, and the edema of the extremities cleared somewhat. She was discharged on the twentieth postoperative day. At home, the signs of right-sided failure gradually increased, and the pulmonary symptoms did not reappear. The patient died suddenly at home four months following operation.

Comment: This was an advanced phase of interauricular septal defect with high pulmonary pressure. The operation was undertaken because of the high volume of the shunt and the precarious condition of the patient. In the presence of tricuspid insufficiency, closure of the shunt did not correct the right-sided failure and operation was too late to be of benefit to this patient.

Case 2.—This patient is a thirty-six-year-old mother of five children, who had had progressive symptoms for four years, consisting of easy fatigue, dyspnea, tachycardia and hemoptysis. On examination, she had signs of atrial septal defect, and catheterization by Dr. Harper Hellems proved the presence of the defect. There was a left to right shunt of 9.1 liters per minute, but the pulmonary artery pressure was 27/11, indicating not more than minimal pulmonary vascular obstructive changes. Operation was carried out June 14, 1955. The interatrial defect was found to be 2.4 cm. in size. The mitral valve opening was about a finger and a quarter in size. The interatrial septal defect was closed with three mattress sutures. The patient did well following operation. She was discharged on the tenth

postoperative day. The x-ray taken two months postoperatively is reproduced with the preoperative film (Fig. 4). The transverse diameter had decreased 1.8 cm. Following operation the patient has had occasional tachycardia but no pulmonary difficulty, no fatigue, and felt considerably improved. Two months following operation the patient became pregnant and was delivered of an eight pound, six ounce, child in breech presentation. There were no signs of failure during the pregnancy or during or following delivery. At present the patient is caring for her six children and feels well.

Comment: This is an example of an adult in whom closure of the defect has been corrective, since there had not been significant increase in pulmonary pressure.

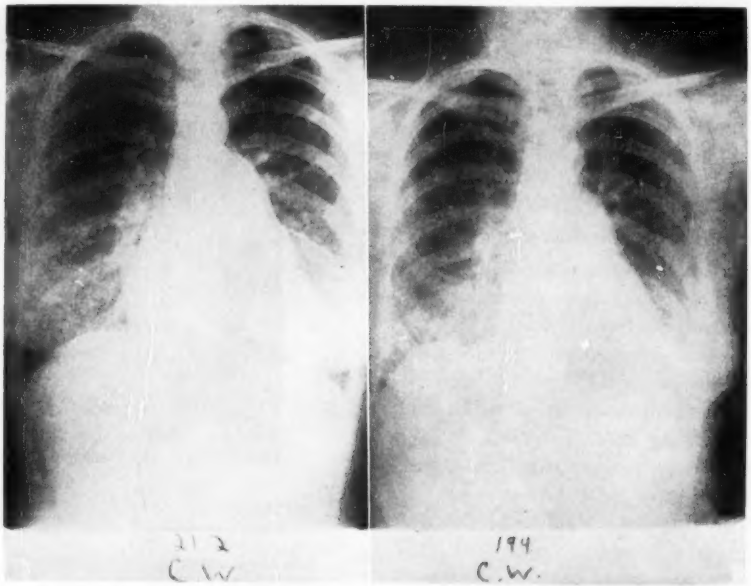

Fig. 4. Case 2. Preoperative (lt) and postoperative (rt) chest radiographs.

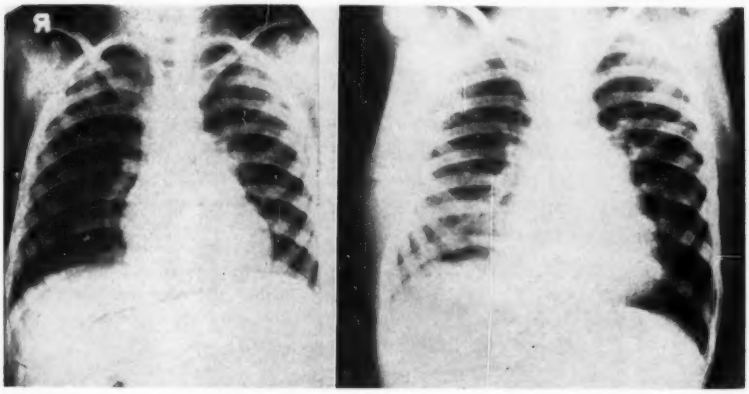

Fig. 5. Case 3. Chest radiographs. Six days postoperative (lt) and two months postoperative (rt) when heart size was normal.

Case 3.—This is a five-year-old girl who had rather slow physical development and frequent colds. She was found to have an enlarged heart with a systolic murmur. Catheterization was carried out January 17, 1955, by Dr. Anthony Nolke; angiocardiography was done February 23, 1955, by Dr. John Hertzler. These tests were consistent with interatrial septal defect. Operation on January 9, 1956, demonstrated a defect of 1½ cm. in diameter, well above the tricuspid valve, which was closed without difficulty with through-and-through mattress sutures. The murmurs disappeared. She was discharged home on the ninth postoperative day. The two-months' follow-up roentgenogram appears with one taken shortly after operation (Fig. 5). It shows the change in size and contour of the heart to

(Continued on Page 90)

Familial Heights as a Useful Guide in the Diagnosis of Genitourinary Anomalies

By Robert C. Moehlig, M.D.
Detroit, Michigan

HAVING observed certain congenital urinary anomalies in association with familial height, it was deemed worth while to report these observations. Many years ago I called attention to the selective action of the endocrine glands on various tissues depending upon their embryologic origin.[1]

In the present article, a brief résumé will be given showing the relationship of the pituitary gland to the genitourinary tract and the relation of the familial height to anomalies of this tract. A potent argument favoring the view that the pituitary affects mesodermal tissues (of which the genitourinary tissues are a part) is seen in the anencephalic fetus with pituitary defects.[1] The pituitary maldevelopment in these fetuses produces an aplasia of the genitourinary tract with small kidneys, defects in the genitalia and adrenal cortex hypoplasia.

It has been shown that pituitary defects result in genitourinary defects as well as mesodermal defects in general. It is also true that pituitary hyperfunction results in hyperplasia of the genitourinary system as well as hyperplasia of the adrenal cortex. The adrenal cortex, a mesodermal derivative, has a selective action on a division of the mesoderm, namely the mesothelium. From this are derived the following tissues:

1. Peritoneum.
2. Pleura.
3. Pericardium.
4. Urogenitals: (a) Wolffian body; (b) Kidney; (c) ovary; (d) oviducts, uterus, and vagina.
5. Striated muscles: (a) Skeletal; (b) cardiac muscle.

The important feature to be discussed is the pituitary, the controlling gland of the mesoderm and the mesodermal subdivision, the mesothelium.

In discussing the relationship between the pituitary and adrenal cortex I said that anterior cerebral defects which include pituitary defects are in turn accompanied by adrenal cortex defects.[1] In 1943, discussing renal rickets, I stated that a congenitally deformed pituitary gland is frequently associated with congenital cerebral defects such as anenecephalus and hydrocephalus. Such a pituitary defect is associated with a secondary genitourinary tract defect in the form of kidney malformation, dilatation of the kidney pelves and the bladder. Agenesis of the adrenal cortex is also usually present. A further association of the pituitary to the genitourinary tract and skeletal system is seen in renal rickets or renal dwarfism. In this disease, diabetes insipidus is frequently present, indicating a posterior lobe defect since these cases respond to vasopressin and are not the result of the renal defect such as is present in nephrogenic diabetes inspidus. This presumes that the anterior pituitary lobe, while defective in development, is not completely so; otherwise, there would be no diabetes insipidus. The same holds true for the kidney, that is some functioning renal tissue must be present albeit the kidneys are small and aplastic.

Chown,[2] in commenting in his studies of renal dwarfism, came to the conclusion that the disease is the result of a pituitary-diencephalon disturbance. He said "The argument in proof of the thesis that a lesion of the pituitary-diencephalic mechanism is the primary cause of the symptom complex called renal rickets is then as follows:

1. Malformation of the pituitary has been found in these cases;
2. The associated symptoms of the dwarfing infantilism and urinary tract dilatation can be caused by such a lesion;
3. The nephritis is not primary but is secondary to an abnormal metabolism, itself the result of faulty bone growth;
4. The faulty bone growth therefore not being due to the nephritis, and the remaining symptoms being due to pituitary-diencephalic disease. It is to be presumed that the bone disease is due to the same cause."

From the Department of Medicine, Harper Hospital and Wayne University, Detroit, Michigan.

In reviewing some of the literature on renal rickets, I was impressed with the fact that developmental defects of the kidneys, urinary tract and skeleton are important features of the disease associated with defects in the pituitary-hypothalamic region. For instance, hydrocephalus may be associated with a pituitary defect and this in turn with an anomalous development and aplasia of the adrenal cortex, urinary and genital organs.[3]

Davis,[4] in his study of kidneys and ureters found coexisting abnormalities of the genital organs. He reported cases of urinary bladder dilatation and kidney anomalies associated with hydrocephalus. Increased intracranial pressure from whatever cause during the early developmental period of life results in pituitary disturbance with consequent genitourinary anomalies and defects. Congenital hypopituitarism of various degrees, even to the extent of complete apituitarism, results in aplasia of the adrenal cortex and the genitourinary tract.

A congenitally small pituitary or underactive deformed pituitary is, therefore, most likely to be associated with maldevelopment of the kidneys and genitalia, such as aplastic malformations which usually include the adrenal cortex.

By the same reasoning and based on clinical evidence, hyperfunction of the pituitary is most likely to be associated with overdevelopment of the kidneys, genitalia and adrenal cortex. This is well illustrated in acromegaly and gigantism. In these diseases the growth hormone affects the whole body structure, increasing the size of the viscera and, of course, this includes the kidneys. It is known that anterior pituitary extracts can increase the size of the kidneys.[5]

If the pituitary activity is reflected in the genitourinary tract, then familial heights may give a clue to urinary pathology. As we know, the pituitary is a most important factor in the development of the skeletal system so that heights of the immediate family may guide one in suspecting what type of genitourinary pathology may be present. This may be briefly summarized by stating that familial shortness of stature is associated with congenital underdevelopment of the kidneys such as is present in renal dwarfism, and that familial tallness is associated with overdevelopment of the kidneys such as supernumerary multiple kidneys, and multiple ureters. Likewise, polycystic kidneys are associated with familial tallness.

The constitutional hereditary background is shown by the familial heights of greater than average sampling of the population. In the First World War the average height of the male recruits was 67 inches and in the Second World War it was 68 inches. In the immediate family it is usually found that the male members are 72 inches or more in height. This could be interpreted as indicating a constitutional familial background of skeletal overactivity as compared with the normal skeletal activity. This, then could indicate a pituitary hereditary factor as responsible for the kidney anomalies, if one grants that the pituitary is necessary for genitourinary development. Applying this same principle to the underdeveloped anomalous defects of the genitourinary tract, it is found that this occurs in the shorter than normal male members of the immediate family. It is of some interest and importance that individuals with a high arched palate usually have pituitary disturbances. This holds for both hypofunction and hyperfunction of the gland. Elsewhere[1] it was stated that, since the anterior lobe of the pituitary develops from the roof of the mouth, the high arched palate indicates a congenital pituitary background that is a predisposition to a disturbance of this gland. It is seen in individuals with migraine, epilepsy, retinitis pigmentosa, arachnodactyly, and in many individuals with an allergic condition, the latter probably being due to a pituitary-hypothalamic disturbance. Individuals with genitourinary defects have, as a rule, a high arched palate.

It should be stated that the short asthenic built individual is the one who suffers from underdevelopment of the genitourinary tract. However, *short, stocky individuals* who have characteristics of pituitary basophilism are apt to have double ureters, reduplication of pelves and horseshoe kidneys, the same as the individual with a tall background. This is due probably to the overactivity of the pituitary before puberty resulting in rapid ossification and shortness of stature. They are the pyknic type of individual. As an example of familial height giving a clue to genitourinary pathology is a family of two boys and a girl, each of whom had two kidneys and two ureters on the left side and a normal kidney and ureter on the right.

The genetic constitutional inheritance factor is shown by the familial heights. Both the father's and mother's height was 72 inches, the two boys

were 72 inches and 74 inches respectively, and the girl 71 inches.

The familial height has been very useful in directing and anticipating genitourinary diagnoses so that attention is directed to this feature as a diagnostic aid.

Summary

Based on clinical and embryologic observations it was found that the state of the pituitary gland is related to the development of the genitourinary tract. Congenital defects of the pituitary gland are associated with congenital genitourinary defects as well as aplasia of the adrenal cortex.

Overactive pituitary function of a congenital nature is associated with overdevelopment of the genitourinary tract and adrenal cortex hyperplasia. Because of the relationship of the pituitary glands to both the osseous system and the genitourinary tract, it has been found over a period of many years that the familial heights are a useful guide to genitourinary anomalies.

The pituitary's selective action on mesodermal tissues (the osseous system, genitourinary tract and adrenal cortex are mesodermal in origin) furnishes an understanding of these mesodermal anomalies.

In a general way, it can be said that familial shortness of stature associated with an asthenic habitus is accompanied by developmental defects of the genitourinary tract, such as renal rickets, aplasia and hypoplasia of the kidneys. However, familial shortness of stature in asthenic built individuals with suggestive pituitary basophilism symptoms results in overgrowth of the genitourinary tract, since the overactive pituitary in these individuals produces early and rapid ossification with shortness of stature. They are therefore, comparable to the tall individual in respect to genitourinary anomalies.

Attention called to the fact that individuals with arched palate usually have pituitary dis es.

This is or both hypofunction and hyperfunction. reason for this high arched palate is believe be due to the fact that the anterior pi y lobe develops from the roof of mouth. viduals with genitourinary defects, have, as a ile, high arched palates.

Conclusion

Familial heights are a useful guide in diagnosing congenital genitourinary anomalies.

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964 Fisher Bldg.
Detroit 2, Michigan

TUBERCULOSIS PROBLEM NOT SOLVED

Despite a gratifying decline in the death rate, the tuberculosis problem in this country will not approach acceptable solution until the morbidity rate demonstrates a corresponding decline. Over the last five years, deaths from tuberculosis have declined between 15 and 20 per cent each year. The morbidity rate, however, has declined only three to four per cent per year over the same period of time. At this rate, more than a quarter century will be required to equal the same per cent reduction in morbidity that has been achieved in mortality in the past five years alone.—*Annual Report, Special Health Services, U. S. Department of Health, Education, and Welfare, Washington, D. C. (1954-1955)*

Paroxysmal Tachycardia in Infants

By Irving F. Burton, M.D., and
Morris Starkman, M.D.
Detroit, Michigan

EARLIER writers have pointed out that the counting of pulse rates in infants is a much neglected procedure. When the counting is done routinely, the incidence of cardiac arrhythmias is found to be higher than the medical literature would indicate. Of the arrhythmias, the one most frequently occurring is paroxysmal tachycardia. Since this type of arrhythmia often terminates fatally, failure to recognize the excessive heart rate is unfortunate inasumch as the prognosis with treatment is excellent.

Because of the general unfamiliarity with this disease, we are presenting four cases and are taking this opportunity to review this syndrome.

Case Presentation

Case 1.—A thirteen-month-old, white male infant was admitted to Harper Hospital, July 6, 1955, with the diagnosis of an acute upper respiratory infection. The baby had been well until three hours prior to admission. At that time, the mother had noticed labored breathing, increased irritability and a short interval of cyanosis. On physical examination, the infant appeared acutely ill and in marked respiratory distress. He seemed very toxic with a fixed apprehensive stare. His temperature was 102.6° F. by rectum. His respiratory rate was 40 per minute, regular and with symmetrical excursion of the chest. Occasional rales were heard in both bases. The pulse rate was counted at 200 per minute. The liver and spleen were not enlarged. No cyanosis or signs of heart failure were apparent. The balance of the examination was noncontributory. An electrocardiogram taken on admission showed a tachycardia of 180 per minute of supraventricular origin. No other cardiac abnormalities were found. The white blood cell count showed no significant alteration in number or in cell components. Urinalysis, throat and blood culture and a chest roentgenogram showed no abnormalities.

The infant was placed in an oxygen tent. 300,000 units of procaine penicillin were administered intramuscularly. Digitoxin was administered orally on the basis of 0.05 mg. per kg. body weight and given in three doses at eight-hour intervals. The first dose contained one-half the calculated digitalizing dose. The second and third doses each contained one quarter of the calculated dose. One-tenth of the calculated dose per day was given for maintenance. Within twenty-four hours, the pulse rate was 110 per minute. The symptoms of dyspnea, toxicity, and elevated temperature all subsided correspondingly. The digitoxin was discontinued on the third hospital day. Subsequent examinations showed no evidence of underlying heart disease. A second electrocardiogram taken on the fifth hospital day was normal. The patient was discharged on the seventh hospital day. No recurrence of this disease has been noted to the present time.

Case 2.—A three-and-one-half-month-old, white male infant was admitted to Harper Hospital, July 26, 1955, with a history of intermittent cyanosis, vomiting, and a temperature of 104° F by rectum for two days. On physical examination, the infant appeared acutely ill, cyanotic, and extremely toxic. His pharynx was moderately injected. His respiratory rate was 48 per minute, regular, and with symmetrical excursion of the chest. No rales or pulmonary abnormalities were found. His pulse was counted at 200 per minute. His liver and spleen were not enlarged. No evidence of heart failure was noted. The balance of the examination was noncontributory. An electrocardiogram taken on admission showed a tachycardia of 200 per minute of supraventricular origin. No other cardiac abnormalities were found. The white blood cell count showed no significant alteration in number or cell components. Urinalysis, throat and blood culture, and a chest roentgenogram showed no abnormalities.

The infant was placed in an oxygen tent. 150,000 units of procaine penicillin were administered intramuscularly. Digitoxin was administered intramuscularly on the basis of 0.05 mg. per kg. body weight. The same schedule of administration and dosage was used as in the first case. Within twenty-four hours the pulse rate dropped to a normal value, and the other symptoms correspondingly cleared. The digitoxin was discontinued on the third hospital day. Subsequent examinations showed no evidence of underlying heart disease. The patient was discharged on the fourth hospital day. No recurrence of this disease has been noted up to the present time.

Case 3.—A three-month-old, white male infant was admitted to Harper Hospital, August 23, 1955, with a history of the abrupt onset of dysynea, listlessness, pallor, and sweating six hours prior to admission. On physical examination, the infant appeared acutely ill, extremely toxic and frighteningly near death. His temperature was 103° F by rectum. His respiratory rate was 36 per minute, regular and with symmetrical excursion of the chest. His breath sounds were harsh and bronchial in nature. His pulse was counted at 190-200

From the Division of Pediatrics, Harper Hospital Detroit, Michigan.

per minute. His liver and spleen were not enlarged. Neither cyanosis nor signs of heart failure were noted. The balance of the examination was noncontributory. An electrocardiogram taken on admission showed a tachycardia of 190 per minute of supraventricular origin. No other cardiac abnormalities were found. The white blood cell count showed no significant alteration in number or cell components. Urinalysis, throat and blood culture, and a chest roentgenogram showed no abnormalities.

The infant was placed in an oxygen tent. 150,000 units of procaine penicillin were administered intramuscularly. Digitoxin was administered intramuscularly in the same dosage formula and schedule as with the previous cases. Within twenty-four hours, the pulse rate dropped to a normal value and the other symptoms correspondingly cleared. The digitoxin was discontinued on the third hospital day. Subsequent examinations showed no evidence of underlying heart disease. The patient was discharged on the fourth hospital day. No recurrence of this disease has been noted to the present time.

Case 4.—A two-week-old, white male infant was seen at another hospital three hours following the repair of a unilateral harelip. He had been given 1/800 gr. of scopolamine preoperatively. For anesthesia, he had been given ether by open-drop. On physical examination, the infant appeared acutely ill and extremely toxic with marked dyspnea and sweating. His temperature was 104.2°F by rectum. His respiratory rate was 42 per minute, regular and with symmetrical excursion of the chest. No rales or pulmonary abnormalities were found. His pulse was counted at 200 per minute. His liver and spleen were not enlarged. No evidence of heart failure was noted. The balance of the examination was noncontributory. An electrocardiogram taken immediately showed a tachycardia of 200 per minute of supraventricular origin. No other cardiac abnormalities were found. The white blood cell count showed no abnormalities.

The infant was placed in an oxygen tent. 150,000 units of procaine penicillin were administered intramuscularly. Digitoxin was administered intramuscularly in the same dosage formula and schedule as with the previous cases. The pulse rate dropped to a normal value on the fourth hospital day and the other symptoms correspondingly cleared. The digitoxin was discontinued on the fifth hospital day. Subsequent examinations showed no evidence of underlying heart disease. No recurrence of this disease has been noted up to the present time.

Discussion

In 1941, Hubbard[1] reported nine cases of paroxysmal tachycardia in infants under the age of one year. He stressed the acute onset of the attack, the alarming clinical picture, and the frequency of fatal termination. In his discussion, he pointed out that many cases of a malignant syndrome of unknown etiology in infants reported in the literature at that time were similar to his cases but that the heart rate had not been counted. On this basis, he felt that the syndrome was much more prevalent than generally reported, probably being overlooked in many cases. In 1952, Nadas and co-workers[2] presented a comprehensive article on this subject with a detailed analysis of forty-one cases in infants and children. They were able to form a concise picture of this syndrome which will be presented in outline form and augmented with our own experience.

Age.—Almost all of the cases occurred in infants four months of age or younger. Three of our cases were four months of age. One patient was thirteen months of age.

Sex Incidence.—All four of our cases occurred in males. This observation is in agreement with other studies indicating that the male is the most frequently affected.

Etiology.—No apparent single causative factor precipitated the attacks. Many infants seemed well prior to the illness. A few had respiratory infections which had been considered trivial. One of our cases had sustained his attack following the use of scopolamine in preanesthesia medication. In Nadas' series, two cases followed anesthesia, and one had atropine sulfate as preanesthesia medication. Although congenital heart disease and the Wolff-Parkinson-White syndrome can be the cause of paroxysmal tachycardia, neither is etiologically important in this age group.

Clinical Appearance.—The onset was usually sudden. The infants appeared acutely and critically ill. They were prostrate with a fixed apprehensive stare and ashen color. Respiration was rapid and labored. The clinical impression was that of an acute septic disease. Many had an elevation of temperature. The urine was usually normal; the white blood cell count sometimes showed an elevation. The roentgenogram of the chest was normal unless there was congestive heart failure. In advanced cases, there was evidence of heart failure with cyanosis, enlargement of the heart and liver, pulmonary congestion, abdominal distension and frequent vomiting. The roentgenogram of the chest may then have shown the heart to be enlarged with both ventricles equally involved and congestive changes present in the lung.

In all cases, the excessive heart rate was outstanding. The rate varied in the individual case. None of the cases had a rate less than 180 per minute, and some had a rate as high as 330 per minute. A heat rate of 180 per minute or higher in an infant should always bring this syndrome to mind.

The appearance of heart failure is dependent on the duration of the attack, not on the rate of the tachycardia. In Nadas' study, none of the infants showed evidence of heart failure when the attack was less than twenty-four hours' duration. After forty-eight hours, one-half of the untreated cases showed signs of failure. In Hubbard's observation, when the syndrome was less clear and treatment not instituted promptly, the infants either died in heart failure or recovered completely, the attack subsiding spontaneously.

Electrocardiogram.—The only significant finding was the tachycardia of supraventricular origin. If other changes should be present, other diseases must be considered. In the Wolff-Parkinson-White syndrome, the characteristic findings are not present during the attack of paroxysmal tachycardia but are revealed only in the electrocardiogram taken between attacks.[3] Repeating the electrocardiogram in these infants when the rate becomes normal is important.

Treatment.—Many methods and drugs can be used for stopping a rapid heart rate. In this syndrome, digitalis has been the most successful and the least dangerous of all therapies. Both Nadas and Hubbard emphasize that the dosage in infants must be higher on a weight basis than ordinarily used in older children and adults. The recommended dose in children under two years of age is 0.03 to 0.05 mg. per kg. body weight with complete digitalization in twelve to twenty-four hours. Not all observers are in agreement with the larger dose.[4] The daily maintenance dose is one-tenth of the total digitalizing dose. The infants are maintained on digitalis two to seven days or longer following the return of the normal heart rate. In small infants, digitoxin intramuscularly is the treatment of choice.

Supportative treatment should also be given. The infants should be placed in oxygen and given antibiotics, if they are indicated.

Summary

Paroxysmal tachycardia in infants is presented as a distinct clinical entity. Counting the pulse rate is a necessary part of an infant's examination.

Acknowledgment

The authors gratefully acknowledge the generous assistance of Dr. Edgar Martmer, chief of the Division of Pediatrics, Harper Hospital, Detroit.

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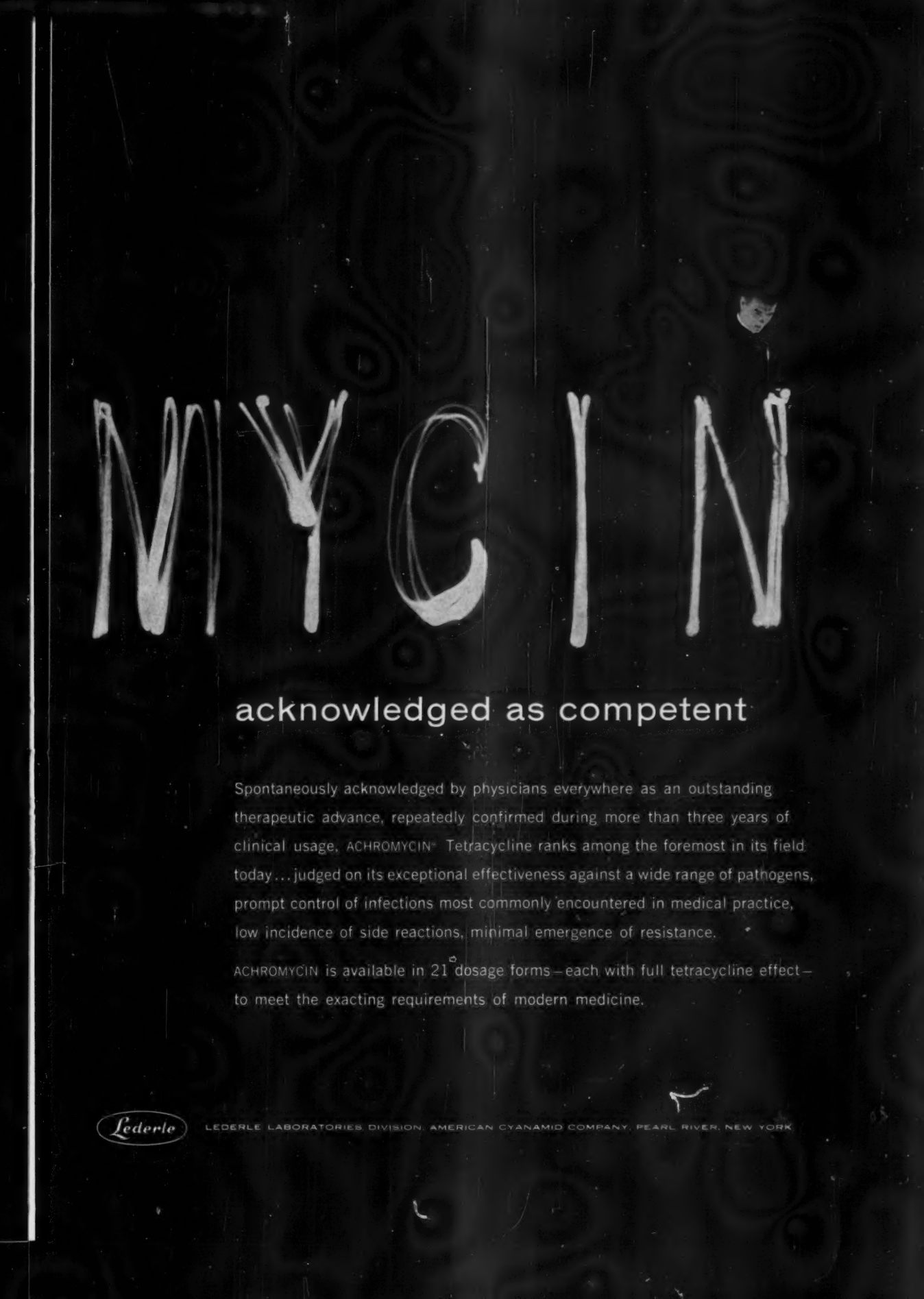

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Modern Techniques for the Diagnosis of Pheochromocytoma

By S. W. Hoobler, M.D., Robert D. Johnson, M.D., and Ray Warzynski, M.D.
Ann Arbor, Michigan

THE PATIENT with pheochromocytoma presents a potentially curable lesion. In the past ten years considerable advances have been made in the precise diagnosis of this condition. It is the purpose of this article to review these advances for the benefit of the practicing physician.

When To Suspect Pheochromocytoma

All patients with essential hypertension should be viewed as suspects. Cases have been found among both the sustained and labile types. The index of suspicion is generally increased when the patient with hypertension also shows transient glycosuria or hyperglycemia, or when episodes of spontaneous sympathetic and vasomotor activity occur with palpitation, tachycardia, flushing, increased perspiration or tremors. It is important to recall that the disease may also occur among apparent normotensives who show blood pressure elevations only with attacks. These attacks may vary in their symptomatology but usually include palpitation, flushing, headache, perspiration, tremulousness, and abdominal pain. Presence of dizziness, numbness and paresthesia of the fingers and about the mouth denote hyperventilation syndrome and are not characteristically caused by pheochromocytoma; relation to meals and relief by ingestion of carbohydrate may denote hypoglycemic episodes.

Diagnostic Procedures If Systolic Blood Pressure Exceeds 200

1. *Regitine Test.*—The best screening test when the blood pressure is substantially elevated (i.e. exceeds 200/110) consists in the slow intravenous injection of 5 mg. Regitine®. Intramuscular injection may lead to a false negative.[1]

(a) *Procedure.*—The patient is placed in the resting recumbent state and the blood pressure is taken every 30 seconds. When the readings have stabilized, a venipuncture is done but the drug is not injected until the blood pressure in the opposite arm returns to the previous basal level. The drug is then given slowly over a 45-second interval, blood pressure and pulse rate being taken every thirty seconds in the opposite arm for a period of five minutes.

(b) *Interpretation.*—A reduction of 25 mm. in the diastolic blood pressure in at least two successive readings is considered a positive response.

(c) *False positives.*—False positives occur in patients under the influence of various antihypertensive drugs. They are reported in uremia, but since this rarely coexists with pheochromocytoma, it is not usually necessary to test hypertensive patients with consistently elevated nonprotein nitrogen in the blood. In the absence of any of these explanations, about 10 per cent of the cases show false positive reactions due, no doubt, to the fact that Regitine, in addition to its adrenolytic properties, has weak ganglionic blocking and direct vasodilator activity. Therefore, *a positive Regitine test should be viewed as a screening test only.* It should be repeated and should be checked with benzodioxane or histamine test.

(d) *False negatives.*—These are rare. It should be noted that if the blood pressure is not greatly elevated, the Regitine test cannot be positive by definition without inducing considerable hypotension, since a diastolic blood pressure fall of 25 mm. is necessary to qualify as positive.

(e) *Contraindications.*—These are relative but would include chiefly patients with a history suggestive of cardiac arrhythmias or angina pectoris. The drug has excitatory properties. Tachycardia is regularly induced and in at least one instance angina pectoris has followed testing. It is believed that this latter effect is transitory, mild and can be overcome by vasodilators, and that if the test is really indicated, no harm can come of the procedure if proper precautions are taken.

From the Department of Internal Medicine, University of Michigan Medical School.
Development of the analytic procedure for catechol amines was greatly aided by a grant from the Michigan Heart Association.

2. *Benzodioxane Test.*—This procedure is indicated when the Regitine test has been positive and the blood pressure is substantially elevated. Details of the test procedure, as printed by the manufacturer, have been modified in our clinic as follows:

(a) *Procedure.*—The calculated amount of the drug is taken up in the syringe and after the basal blood pressure has been determined in the opposite arm, a venipuncture is performed and the blood pressure allowed to return to the basal level. The drug is then injected slowly at a steady rate such that one-half the dose has been administered in the first minute. The blood pressures taken every 30 seconds on the opposite arm are then inspected. If a rise of less than 15 to 30 mm. Hg. systolic or diastolic has occurred, the remainder of the dose is given in the second minute. If such a rise has already occurred, the injection is stopped, since in all likelihood the test will be negative and further injection may only cause distressing side effects (tachycardia and dyspnea) and a further elevation of the blood pressure. Since the blood pressure may arise falsely due to anxiety, it is important that the patient be reassured prior to the injection and that if possible he should not know the moment the injection is started. The more elaborate testing technique of Goldenberg and Aranow[2] was devised for this reason.

(b) *Interpretation.*—According to the originators of the test, a positive reaction can be judged only when it is performed according to their precise technique. In our experience, any reduction exceeding 5 to 10 mm. Hg. of systolic and diastolic pressure by our technique should be viewed as a positive reaction.

(c) *False negative reactions.*—False negative reactions occur with greater frequency than with the Regitine test, probably because the drug has a concomitant central excitatory and hypertensive effect, combined with a weaker adrenolytic and no vasodilator activity.

(d) *False positive reactions.*—These are said to occur in uremia.

(e) *Contraindications.*—The drug should be given carefully in extremely hypertensive patients but the procedure outlined above should protect from serious reactions. The central and cardio-excitatory effects on the heart rate might be adverse in angina pectoris, but we have had no such personal experiences.

3. *Urinary Catechol Amine Analysis.*—Approximately 3 per cent of intravenously administered adrenaline or noradrenaline can be recovered in the urine by sensitive bioassay techniques. This recovery is further reduced if the urine is neutral or alkaline and subject to oxidation. There is a wide variation in "normal" 24-hour urine catechol amine excretion, the limits being approximately 10 to 100 micrograms per twenty-four hours.[3]

(a) *Procedures.*—During the collection period it is important that each urine specimen be immediately acidified to prevent oxidation of catechol amines. Fluorescent contaminants present in most stoppers must be excluded by covering with cellophane. After the specimen is collected, an approximate 100 cc. aliquot may be taken for chemical or biologic assay.*

(b) *Chemical method.*—The urine is passed through an alumina column which adsorbs 90 to 100 percent of catechol amines. It is then eluted with acetic acid and oxidized by the addition of potassium ferricyanide at pH 6.5 to adrenachrome. Ascorbic acid is then added to stop further oxidation and the adrenochrome is rearranged to the highly fluorescent adrenolutin by the simultaneous addition of NaOH. The mixture is read in the Farrand photofluorimeter and compared with a similar urine sample which, by omitting the ascorbic acid oxidation, has been permitted to go to complete destruction of the catechol ring structure. Although the norepinephrine derivative possesses only one-fourth of the fluorescent activity of epinephrine, the two cannot be separated by this test. For consistency, the result is expressed as micrograms of epinephrine. This is essentially the method of Von Euler et al[4] and can be performed using any sensitive photofluorimeter. Both adrenaline and noradrenaline added to urine are measured accurately by this procedure. Other related substances may also contribute to fluorescence. The procedure is not quite the same as that used by Goldenberg, but on the basis of considerable experience we believe that a satisfactory distinction between normal, hypertensive, and pheochromocytoma cases can be made.

*The sample can be sent in a special mailing carton provided on request from the Hypertension Unit, University of Michigan Hospital, Ann Arbor, Michigan. The cost of the test is $15.00.

TABLE I. RESULTS OF TESTS IN PROVEN CASES OF PHEOCHROMOCYTOMA

University Hospital 1956

Cases	Histamine Test	Regitine Test	Benzodioxane	24 Hour Catechol Amines* Mcg/24 hr.	
				Pre-Operative	Post-Operative
W. H.	. .	+	+	645 512	46
R. J.	. .	+	+	665 502	
R. B.	. .	+	+	243** 144 118	

*Of 37 normal persons and pheochromocytoma suspects, the mean twenty-four hour excretion of catechol amines, expressed in terms of epinephrine equivalent, was 49.2 micrograms with a range of 9.4 to 107.5. One false positive of 486 is recorded, but subsequent preoperative values were 87 and 44 mcg/24 hours. A bilateral adrenal exploration was negative.

**This patient had a small area of adrenal medullary hyperplasia at operation, but when the adrenal was clamped the blood pressure fell markedly. The findings did not resemble the usual pheochromocytoma pathologically and her status remains in some doubt.

(c) *Biological method.*—This is a complex procedure, depending on the contraction of a spirally cut strip from rabbit or rat aorta when solutions containing .01 to .0001 micrograms of adrenaline are compared to the response of the unknown sample eluted from the alumina column. The method used in our laboratory is patterned after the technique of Helmer with certain local modifications. The test is used when the urine sample by the chemical method shows a high output of catechol amines.

(d) *Interpretation.*—It is evident from the above that unknown contaminants may produce either fluorescent or vasoactive compounds which resemble adrenaline or noradrenaline. No drugs capable of producing fluorescent end products should be given during the urine collection. Furthermore, adrenaline and noradrenaline cannot readily be distinguished by these methods but since both are found in varying amounts in cases of pheochromocytoma, this would seem to make little practical difference.

(e) *False positives.*—False positives may appear as experience with the method increases. For this reason consistency with clinical and pharmacologic testing should be insisted on before advising adrenal exploration. In one such case, where preoperative catechol amine levels were 486 and 87 micrograms per twenty-four hours, exploration failed to reveal a tumor in the adrenal region. A high level is therefore not certainly diagnostic. In three cases proven at operation, levels have been consistently high (Table I).

(f) *False negatives.*—False negatives can occur if proper precautions are not taken in the collection. Also, it is possible that during a period of normotension no elevation of urinary catechol amines would occur. In such circumstances it might be better to obtain a specimen during an attack. For this purpose a four hour urine collection test has been devised (vide infra) but we do not yet have sufficient evidence of the normal range of such short collection periods during "attacks" associated with other causes than adrenaline release. Consequently, normal standards at present must be inferred from our experience with twenty-four hour urine samples. On this basis, a positive test should probably exceed 25 mcg. excretion in a four hour collection period.

(g) *Contraindications.*—None. It is to be emphasized, however, that this procedure should be done only when clinical criteria and pharmacologic testing are compatible, since a negative Regitine or histamine test is extremely unlikely to occur in the presence of a pheochromocytoma. Only when angina pectoris makes the latter tests dangerous to the patient should urine testing precede pharmacologic testing.

Diagnostic Procedures If Systolic Blood Pressure Is Below 200

1. *Histamine Test.*[5]

(a) *Procedures.*—Histamine acid phosphate solution is used. 0.0275 mg./cc. (= .01 mg. histamine base/cc.) is prepared fresh every month or so and stored in the refrigerator. The dilution represents 1/100th the strength of the 1/1000 histamine usually supplied. After the blood pressure has stabilized, give in 10 to 20 seconds 2.5 cc. (.025 mg. of the base) intravenously, taking blood pressure every thirty seconds in the opposite arm for five to ten minutes.

The usual response is a flush, vasodilator headache and transient hypotension lasting one to two minutes, followed by return to normal or slightly supernormal values in next three to five minutes. If the subsequent rise exceeds the preinjection level by 30/20 mm. Hg., pheochromocytoma is suspected. Leave the needle in the vein after injection, so as to be prepared to give Regitine®, 5 mg. intravenously in case of a hypertensive reaction.

(b) *False positives.*—The reactions may be due to anxiety and discomfort from the histamine.

Rises usually do not exceed that observed by the cold pressor test. Reassurance, explanation of symptoms to be expected from test, and repetition often are needed to exclude. A certain number occur, nevertheless.

(c) *False negatives.*—Although rare, these also occur. Check with the Etamon test (see below).

(d) *Contraindications:*

(1) Rarely give to patients with systolic blood pressure over 200 for fear of excessive hypertension. Have Regitine,® benzodioxane, nitrites present for antidotes.

(2) Give rarely or never in the presence of angina or severe asthma. Reduce initial dose in seriously suspected cases or severe hypertension.

(3) Always have Regitine® at hand and be prepared to administer it promptly if an attack is precipitated. Under these circumstances there is no need to fear reactions to this test.

2. *Tetraethylammonium (Etamon) Test.*[6]

(a) *Procedure.*—200 to 300 mg. of tetraethylammonium chloride (Etamon—Parke Davis) is given intravenously twenty to thirty seconds after blood pressure has become basal. The patient will notice paresthesias, blurring of vision and a mild tachycardia, and the blood pressure will fall 10 to 40 mm. systolic and diastolic in normals and mild hypertensives. In uremics and in some elderly patients with arteriosclerosis, more marked hypotension will occur but can be corrected promptly with a head down tilt or intravenous vasoconstrictors. Hence, over the age of fifty a dose of 200 mg. intravenously is sufficient for most routine tests. The effects last for 15 to 20 minutes, and orthostatic hypotension is the last to go away. Hence, these patients should be observed for syncope when they first get up after the test.

(b) *Interpretation.*—In the presence of pheochromocytoma most but not all patients show a marked secondary rise in blood pressure after the period of hypotension. The secondary rise should exceed the pre-injection blood pressure by 20 to 30 mm. Hg. A moderate rise in blood pressure occurring in young persons after tetraethylammonium, may be the source of a false positives. The test is not as likely to be positive as the histamine test.

(c) *Contraindications.*—None except in patients with extreme arteriosclerosis or angina, who should receive smaller than average doses. If an attack is precipitated, the patient should be made to sit up and hang his legs over the side of the bed, since orthostatic effects may cancel out part of the epinephrine-induced hypertension.

Procedure During Acute Attack of Hypertension

(These first two measures may be done by the patient after proper advance instructions.)

1. Record pulse, blood pressure.

2. Start a four-hour urine collection for catechol amines.

If the patient can remember the precise time of preceding voiding, force fluids and continue collection into an acidified bottle up to the fourth hour. If the exact time of the previous specimen is uncertain, the patient should void immediately and discard, then collect the following four hours of urine. Water should be taken to provide an adequate four-hour volume.

3. Take an electrocardiogram since transiently peaked T-waves may be associated with the hyperpotassemia of epinephrine release (See below).

4. Draw sample for blood sugar, which may show transient elevations, or test for glycosuria.

5. Give 2.5 mg. Regitine intravenously in forty-five seconds, recording pulse and blood pressure carefully. Patients in an attack are hypersensitive to Regitine, and a brief but marked response to a small dose is of diagnostic help.

6. If attack is serious, the further administration slowly of up to 10 mg. of Regitine should provide relief.

Clinical Observations

In general, it has been our practice to follow the outline above. We screen most patients with labile or established hypertension by means of pharmacologic tests. In our clinic, 136 tests were performed in the year 1956. Five apparent false positives were recorded among eighty-eight histamine tests and six among forty-eight Regitine tests. When clinical signs or confirmatory pharmacologic tests were positive, urinary catechol amines were determined. Table I reviews the

three positive cases which have been encountered during the past year.

Case Report

The patient described below proved of particular interest because his presenting complaint was recurrence of very brief spells of palpitation and irregular pulse on exertion.

R. J., a thirty-two-year-old male laboratory worker for a paint company entered the hospital with the chief complaint of "high blood pressure and weak spells" since November, 1954. He was essentially well until that date, when one afternoon at 3 p.m. he had an episode of weakness, pallor, perspiration and dizziness lasting ten to fifteen minutes after hurrying up a flight of stairs. No similar symptoms occurred until April, 1955, when an attack lasted ten minutes and was associated with an excruciating occipital headache. From April through June, 1955, these episodes occurred about weekly and almost exclusively in the late afternoon, except for one severe headache which awakened him at 5 a.m. and disappeared spontaneously in about ten minutes. A sequence of events elicited from the patient included an aura, described as a sensation of "draining of strength," followed by a throbbing headache, a slowing of the pulse and measured rise in blood pressure. At these times his face was observed to be ashen grey and his body was drenched with sweat.

Progressive impotence was another presenting symptom in this young man. Regitine and histamine tests done at another hospital were reported as "inconclusive" and intravenous pyelograms and blood sugar were normal. The patient's father had diabetes mellitus.

Examination revealed a healthy appearing and well muscled man with a casual blood pressure of 160/90 and pulse of 60 per minute. The pupils were dilated and the fundi showed no hypertensive or diabetic retinopathy. Skin was warm and moist. There were no tremors. The thyroid gland was not enlarged. Heart was normal in every way, including size, except for the bradycardia. Liver extended 4 to 5 cm. below the right costal margin, but no other abdominal or flank masses could be felt. Femoral and peripheral pulses were normal.

Laboratory studies showed a normal urine, stool and Kahn reaction. White blood count was 9,300, and there was a normal differential, with 18 per cent lymphocytes and 1 per cent eosinophils. Serum creatinine was 1.12 mg. per cent, and the clearance was 187 L/24 hours. Nonprotein nitrogen was 33 mg. per cent. Basal metabolic rate was +15 per cent. Bromsulfalein retention in forty-five minutes was 15.9 per cent. Fasting blood sugar determination showed 129, 111, 107 (Somogyi-Nelson: normal is 60 to 90 mg. per cent). A glucose tolerance test run after a standard three-day preparation diet gave a diabetic type curve: fasting blood sugar, 107; at one hour, 250; at one and one-half hours, 205; at two hours, 164; at two and one-half hours, 138; at three hours, 119; at three and one-half hours, 104; and at four hours, 69 mg. per cent. A 4 plus glycosuria occurred from the first hour through the second hour. No attack of symptoms of hypoglycemia appeared at the fourth hour.

While in the hospital his temperature reached 99° to 99.2° on only two days, pulse varied from 55 to 90 per minute and the blood pressure varied from 105 to 220 systolic and from 70 to 120 diastolic. A characteristic postural change in blood pressure and pulse was found. The recumbent blood pressure was 175/85 with a pulse of 72 per minute; it fell to 120/80 immediately upon standing, with a pulse of 128 per minute and to 145/110 after standing two minutes. During one of his attacks the patient noted a dull pain in the left flank (the side which proved to contain the tumor).

An interesting finding documented both at another hospital and here were the electrocardiographic changes during the attack; these included frequent ventricular premature beats, bradycardia and large narrow upright T-waves, the latter suggestive of an initial hyperkalemia. A subsequent electrocardiogram was entirely normal after the attack.

Regitine and benzodioxane tests were positive, as well as the aorta strip test. Catechol amines in the urine during an attack were 502 mcg. and 665 mcg. per twenty-four hour specimen of urine (normal range 10 to 100 mcg.). One Regitine test run during an active phase of the disease showed an unusual response. Just before the test dose of Regitine, the blood pressure was running 242-258/100-104 and diaphoresis was evident. Pulse was very slow, 56 to 60 per minute but no ectopic beats were present. Thirty seconds after 5 mgs. of Regitine was given intravenously, the blood pressure fell from 240/76 to 160/66, then rose abruptly to 300/142 in association with an agonizing headache and abdominal pain, pallor and diaphoresis. Pulse rose to 120. The attack subsided in approximately five minutes.

On June 28, 1956, after cortisone preparation, a simultaneous bilateral exposure revealed a tumor of the left adrenal gland. During manipulation of the tumor the blood pressure rose to 230/160 and fell to 90/60 as soon as the blood supply to it was clamped. The postoperative course was uneventful and the microscopic material was reported as typical for pheochromocytoma.

Three months later the patient was asymptomatic with a blood pressure of 130/65, and the glucose tolerance test was no longer diabetic in type.

Comment.—This patient presented four unusual features. His presenting symptoms had features in common with functional hypoglycemia and with attacks of premature ventricular beats. The complaint of impotence and the presence of an orthostatic blood pressure fall suggested widespread inhibition of sympathetic vasomotor tone. The development of upright T-waves of the hyperkalemic type during a paroxysm suggest a possible diagnostic test during an attack, although it must be emphasized that T-wave changes may occur from a variety of causes unrelated to serum

(Continued on Page 83)

Cerebral Angiography

By H. Harvey Gass, M.D.
Detroit, Michigan

ALTHOUGH cerebral angiography is now a commonplace procedure, prejudice against its use still lingers in some quarters. In some of the vascular diseases it is irreplaceable, while in the problem of brain tumors, especially those located supratentorially, it may provide accurate and easy diagnosis, often making the cumbersome, time-honored air study unnecessary. The more one uses cerebral angiography the greater it increases in value, not only for positive identification of existent disease, but also as a survey tool to help exclude the presence of disease resulting in greater reassurance for both patient and doctor. That there are limitations to its diagnostic use and associated pitfalls, no one will deny; but as our familiarity with angiography grows these become more readily recognized and unsuspected information about patients is frequently uncovered, such as previously unrecognized vascular occlusions, vasospastic tendencies, and collateral circulations. The role of the variability of the caliber of intracranial vessels and rate of cerebral blood flow are virgin fields in which cerebral angiography may yet find further fruition.

The resistance to the performance of this procedure which the neurosurgeon still encounters from time to time frequently stems from early reports about mishaps associated with its use. Such accidents were not infrequent during the period of introduction of this technique. The high risk conditions were identified which stimulated technical refinements and led to the development of increased safety in cerebral angiography. Several recent reports attest to this point of view.[1-5] To further dispel unwarranted fear about this procedure this report is being made on 500 consecutive angiograms, all performed by the author, with only a single death in which the procedure can be implicated. Technical points which have enabled the achievement of this record will be discussed.

The 500 cerebral angiograms forming the basis of this report were done in 364 different patients, and all were performed percutaneously. The first sixty-two of these arteriograms were the basis for an earlier report on the use of urokon in cerebral angiography.[6] In this series, 474 were carotid angiograms and twenty-six were vertebral. They were performed in fourteen different hospitals in the Detroit area, over half of them being done in one institution.*

The subjects were male in 289 of the arteriograms and female in 211. The age distribution is given in Table I. Of the entire group, 452 were done in patients between the ages of twenty and seventy. The youngest patient was three and one-half years of age and the oldest seventy-nine. A total of three arteriograms were done in two patients aged seventy-nine.

TABLE I. AGES OF PATIENTS

0 – 9	7
10 – 19	28
20 – 29	59
30 – 39	113
40 – 49	128
50 – 59	89
60 – 69	68
70 – 79	13
Total	500

All the angiograms done on children aged twelve or under were performed under general anesthesia except one done on a twelve-year-old boy who was awake during the procedure. Of the twenty-eight angiograms done in the age group ten to nineteen, seven were given general anesthesia and five were in patients in coma. Of the total group of 500 angiograms, forty-eight were done in patients in coma or under general anesthesia and 452 were done in conscious and responsive patients.

In 133 of the 364 patients receiving angiograms gross lesions were demonstrated (Table II).

TABLE II. PATHOLOGIC LESIONS FOUND BY ANGIOGRAPHY

Lesion	*No.*
Mass	78
Aneurysm	29
Malformation	8
Occlusion	8

These included seventy-eight mass intracranial lesions, twenty-nine aneurysms, eight vascular malformations, and eight major vascular occlusions (either middle cerebral or internal carotid). The

*Mt. Carmel Mercy Hospital.

anterior cerebral or the posterior cerebral system may at times not fill in the arteriogram, and such non-filling alone was not considered diagnostic of occlusion of these arteries. In addition important information was obtained in thirty-nine additional patients. These included twelve patients in whom a normal angiogram was relied upon to rule out a traumatic intracranial hematoma and twenty-seven patients in whom operative angiographic evaluation was essential, as in postoperative aneurysm patients to verify satisfactory obliteration of aneurysms by clips. Thus in 172 of 364 patients, information critical for the patients' management or diagnosis was revealed by the angiogram. In the remaining 192 patients, normal angiograms were obtained in patients suspected of serious gross intracranial disease. In twenty-two patients, the angiogram alone without an air study gave ample information for accurate localization of an intracranial mass, and in an additional seventeen patients angiography alone revealed the presence of a surface hematoma. In none of these thirty-nine patients was the angiogram in error.

Ill effects associated with cerebral angiography may be grouped in the following categories: (1) discomfort associated with performance of the test, (2) dye sensitivity, (3) air embolism (4) hematoma formation in the neck, (5) minor neurologic reactions, (6) major neurologic reactions, and (7) death. The first four of these did not present a serious problem in this series, but will be mentioned in subsequent portions of this paper. Included in minor neurologic reactions are transient neurologic incidents completely reversed in less than twenty-four hours (hemiparesis, hemisensory symptoms, aphasia, hemianopia), precipitation of a grand mal seizure without subsequent sequelae, and precipitation of an attack of atypical migraine (one patient). Such reactions occurred in conjunction with twenty-six arteriograms. In three of these patients a brain tumor was present.

The only serious ill effects of cerebral angiography in our experience in this group concerns the major neurological reactions (neurological incident lasting more than twenty-four hours) and death in which the arteriogram is implicated. There were six patients in whom major neurologic reactions developed and one patient in whom death occurred following the angiogram. In the latter, death in an already critically ill patient must be considered to have been hastened by the test. Of the six patients with major neurologic reactions two had brain tumors, one had a ruptured cerebral aneurysm, and three had serious cerebrovascular disease. Four of these had full recovery of their neurologic incident in less than six months even though subsequent craniotomies were done in two. A fifth patient, a seventy-five-year-old man with left optic atrophy and mild mental changes tolerated the left arteriogram without incident, but on the day following the right arteriogram, despite demonstration of a right internal carotid artery occlusion, he developed weakness of the left upper extremity which was still present one month later. The sixth patient was a fifty-seven-year-old man with a malignant brain tumor, who developed a right hemiplegia and aphasia without loss of consciousness following the arteriogram. By the following day the hemiplegia had nearly completely recovered, but not the aphasia. His neurologic status was otherwise good. Craniotomy was performed on the next day and the patient expired on the first postoperative day. This was clearly a surgical death, and it is felt that the arteriogram was not a significant factor as a cause of death. The single death in this series in which angiography is culpable occurred in a forty-nine-year-old woman who had a recurrent subarachnoid hemorrhage one week after the initial bleeding. The arteriogram was done on the following morning and general anesthesia seemed advisable. She expired twelve hours later never having reacted from the anesthetic. In this case two safeguards discussed later were not adhered to: (1) A general anesthetic was used which camouflages any untoward reactions to a previous injection, and (2) two additional unnecessary injections were made because of failure of a new radiologic device.

Thus, there was a total of thirty-three reactions to arteriograms in this group of 500, an incidence of 6.6 per cent. Only seven of these (1.4 per cent) were serious. The one death constitutes an incidence of 0.2 per cent. It must be emphasized that this low rate of complications occurred in a group of patients with a high incidence of serious and critical illness. Omitted from consideration in this mortality rate are fifty-four additional patients known to have died at some time subsequent to the arteriogram. In forty-nine of these, death was distantly removed from the arteriogram and in no way could be

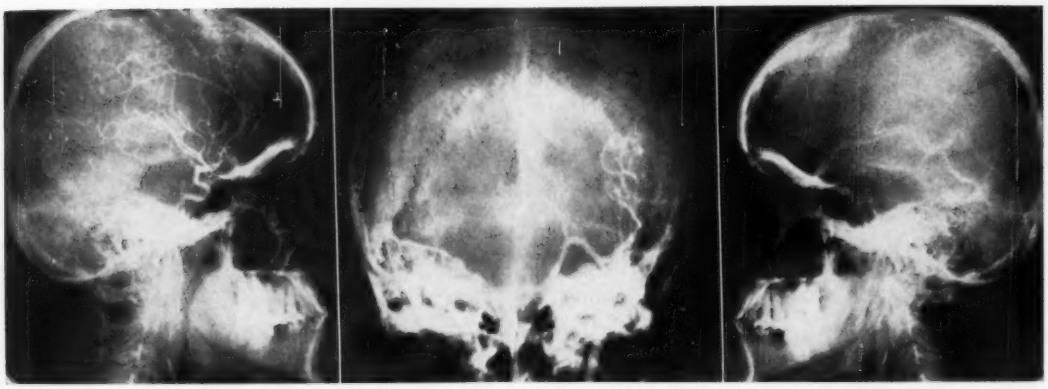

Fig. 1. Arteriogram (lateral view) made with 3 cc. of 30 per cent urokon. Note "stretched-out" pericallosal artery indicating hydrocephalus.

Fig. 2. Arteriogram (occipital view) made with 3 cc. of 30 per cent urokon. Note elevation of anterior cerebral artery caused by pituitary tumor.

Fig. 3. Normal venogram (lateral view) made with 3 cc. of 30 per cent urokon.

considered to be influenced by it. In five patients, however, death occurred within twenty-four hours of the arteriogram, but each of these were comatose at the time of arteriography and showed no evident reaction to it, the cause of the coma in each being ample cause of his death.

Of the 500 arteriograms, 483 were done with 30 per cent urokon sodium. This became the medium of choice, although it should be stressed that the safety of this medium rests to a large measure also on the small quantities per injection which were used. In ten arteriograms, 35 per cent diodrast was employed in part or all of the test. In three arteriograms, lesser dilutions than 30 per cent of urokon[6] were used, but the resulting films were not completely satisfactory. Four arteriograms in elderly or severely hypertensive patients were done utilizing thorotrast for some or all of the injections. In no instance was thorotrast injected unless the needle was cannulated far into the artery making extravasation impossible.

Of great importance in maintaining a safe technique is the reduction of trauma to the arterial tree not only in performing the arterial puncture, but by the reduction of the overall irritating stimuli to the intimal surface of the cerebral vascular system. In this regard, the total number of injections required for the arteriograms, the total quantity of contrast medium used, and the quantity of medium per injection are important factors. We have become increasingly impressed with the importance particularly of the latter, the quantity of medium used per injection, and have been able to progressively decrease the amount used down to 5 cc. per injection and more recently to 3 cc. per injection and still to obtain good films almost consistently. Only 5 cc. quantities were used in 408 of the angiograms in this series, and in a total of 444 angiograms 5 cc. or less were used per injection. Most of those done using larger quantities were in the first part of this series (twenty-eight of the first forty-one).

Of the last twenty-nine angiograms done in this series, twenty-five were performed utilizing only 3 cc. per injection, and in each good arterial filling was demonstrated (Figs. 1 and 2). Venous visualization was also usually adequate (Fig. 3), but occasionally an injection might have to be repeated with a delayed exposure to get a good venogram unless a serial technique was used. Sixteen of these last twenty-nine arteriograms required only two injections of 3 cc. each—a total of 6 cc. per arteriogram!

The 500 angiograms required a total of 1281 injections. Two injections only were used for 230 angiograms. Eight patients required over five injections, one patient requiring eight. These excessive numbers of injections were needed for detail in multiple phases and/or perspectives in aneurysms or vascular malformation patients. In sixty-eight angiograms only a single injection was used. Occasionally, the test was stopped after the first injection because of an unfavorable reaction to that injection, but in the majority of instances single injections were used for a single

anterior-posterior view to determine presence or absence of shift of midline vessels or of a subdural or extradural hemorrhage. Additional injections for lateral views would have been superfluous.

Early in this series, several instances of a large total quantity of contrast medium being used are on record. In one instance, when injections of 10 cc. quantities were customary, as much as 60 cc. of 30 per cent urokon was used. Most of the other multiple injection arteriograms, however, when smaller quantities were used, do not represent such a large total quantity of medium. Thus, one arteriogram was done using eight injections and a total of 40 cc. of media, another needed seven injections and a total of 35 cc., and four required six injections and 30 cc. each. More recently a six-injection arteriogram was required, in which only 3 cc. per injection was used, or a total of only 18 cc.

Of the 1281 injections of dye made, thirty-two were partly or completely extravascular. Such injections caused immediate increased pain during and shortly after the injection. Otherwise no other ill effects occurred except in one patient who suffered an immediate minor neurologic reaction with a quick complete recovery. In none of these thirty-two cases was thorotrast used. Several times x-rays of the neck subsequently demonstrated complete absorption of the dye within a few hours. An injection of urokon and diodrast outside the lumen of the carotid artery meets greater resistance and creates severe local pain in the neck, ear and jaw which subsides within a few minutes. An injection outside the lumen of the vertebral artery causes severe pain in the shoulder and arm, which likewise usually subsides in a few minutes. In one such instance, brachialgia lasted several days probably because an associated nerve root at that site was irritated by the dye.

Discussion

A good safety record can be maintained by adhering to two prophylactic concepts. The first is care in selection of patients, and where greater risk patients must be subjected to the test, rigid attention to safety features in technique must be applied. The second is a constant respect during technical performance of the test for its potential hazards with corresponding insistence on efficient, safe technique. Despite faithful application of these two principles, some reactions will still occur, but with proper safeguards they can ordinarily be rendered innocuous. These contentions do not deny the need for still further technical improvements. As of this writing, two major advances are still needed: (1) The development of a more perfect contrast medium (one which will provide good contrast, but which is still painless, nonirritating, nonradioactive, and readily excreted or destroyed by the body); and (2) a more dependable simple technique for vertebral angiography.

In accepting a patient for this test, there is comfort in the knowledge that in most patients there is a large margin of safety with regard to neurologic accidents or fatalities. These patients will tolerate a traumatic arterial puncture, repeated large injections of contrast medium, extravascular injections, and sundry other insults without neurologic sequelae. There is a significant number, however, who beforehand give warning of potential complications. These include the aged, the arteriosclerotic, the hypertensive, patients who have recently bled from aneurysm, and the patient with a known intracranial mass lesion. Then there is still another group of patients who give no such warning, but who for some unknown reason tolerate a local vascular insult such as caused by injection of contrast medium less well than others. Patients in whom this is likely to occur cannot be recognized in advance, but will show their intolerance to the procedure by neurologic reactions during the performance of the test. In both these latter groups a neurologic reaction following an injection of dye or even to attempted cannulation of the artery is a danger signal for trouble ahead, which if ignored is apt to lead to a disastrous complication. Thus, a patient who, following the first injection, is unable to move the contralateral extremities fully, or who complains of numbness in those parts, or who is having speech trouble, when subjected to a repeated vascular trauma with another severe injection may have such a transient complication converted to a more permanent one. It is important for the operator to know "where his patient is" after each injection. For this reason we believe that the procedure should be done under local anesthetic in a fully-awake patient whenever possible. It can be made to be nearly pain free and tolerable under local anesthetic only. We do not hold with those that believe that the theoretical benefit of relaxation of cerebral ves-

sels under general anesthesia overcomes the advantage of knowing that your patient has not reacted well to the injection just given. In an anesthetized patient this reaction is masked. When it is necessary to do cerebral angiography in an unconscious patient or in one in whom general anesthesia cannot be avoided, as in children or grossly irrational patients (in whom restraining head and extremity compression straps are inadequate), it is important that the number of injections (small quantities) be kept to a minimum and ample rest periods for recovery be allowed between injections.

Often, therefore, it is possible to cut short the usual technique as soon as the problem is solved. In a stuporous or comatose patient, for example, in whom a surface hematoma is suspected, who shows in the first film (an anterior-posterior view) a significant shift of anterior cerebral arteries to one side with a pathognomonic free space between cortical vessels and calvarium indicating a surface hematoma, there is no need to risk a second injection trauma to obtain a lateral view. Angiograms, therefore, should be done only by those persons who are fully aware of the problems of the case and who will carry out the definitive therapy. In this way, injections which will yield little or no clinical information may be avoided.

Other occasions develop where a purely neurosurgical decision of clinical management is made during the course of the performance of the test as the wet films are seen following each injection. These may include cessation of the test, need for certain oblique views, demonstration of collateral ability of Circle of Willis, legibility and adequacy of the films, et cetera. This procedure may be accepted once by the patient without much complaint, but he is apt to be bitter if a repetition is needed because of some oversight when it was first performed. If the responsibility of this test is placed upon a resident in training, he must be prepared to make accurate and complete neurosurgical diagnosis as he goes along or have each set of films as they are developed interpreted for him by someone who can.

Technique

One cannot underestimate the importance of technique when considering the safety of cerebral angiography. Unlike some medical investigative procedures, the outcome of this test may depend on the care and efficiency with which it is done by different operators. Safe angiography may be done in a variety of ways, the differences in technique depending upon the operator's preferences, the radiologic facilities available, and the patient's disease. Angiography as done by a single operator always in the same institution may not be suitable for the itinerant neurosurgeon who answers consultations in many institutions. It is not always feasible or safe to transfer a patient who may benefit from the information obtained by the test from one institution to another solely for the performance of angiography. The technique which was developed and has been utilized for most of the patients in this series has proven itself to be safe, reliable and simple, and easily adaptable to any general hospital, even though it is utilized there rarely. Experience with several specially built units for taking multiple serial films has failed to prove their value to the author for routine angiographic diagnosis. In the occasional circumstance where interval exposures beyond the customary arteriographic and venographic phases may be needed, they can be readily obtained by another injection and timing of exposures earlier or later than is usual. Thus the elimination of special equipment has enabled increased utility of this test.

Several features of technique deserve comment. Especially in hospitals where the personnel are unfamiliar with cerebral angiography, it is important that the neurosurgeon take complete charge of the procedure, especially from the radiologic point of view. If he yields to the factors, patient positions, tube position, cassette position imposed by a technician inexperienced in this test and somewhat in variance with his own experience, he will frequently end up with an underexposed film or one showing the head rotated or not properly centered. If necessary, it is wise before actual performance to take one or more exposures of the head in the test position to perfect technique. Unnecessary injections which increase both the pain and the hazard may be reduced by proper planning.

Preference for local anesthesia has already been stressed in order that greater control over and prevention of untoward reactions may be achieved by the operator. With experience the test may be made to be almost pain free. Ordinarily, aside from the pain associated with the introduction of local anesthesia, there is momentary sharp pain as the needle pierces the carotid artery and

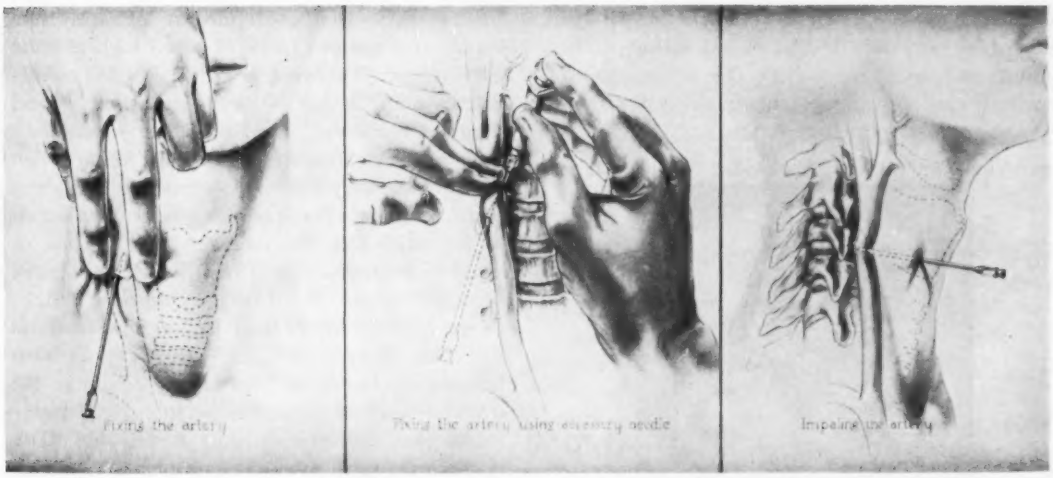

Fig. 4. Fixing and transfixing the artery.

again as the needle is withdrawn at the completion of the test while pressure is being made against the puncture site to prevent local hematoma. Description of the discomfort associated with injection varies with the patient and the amount, the type and rate of injection of the contrast medium. A rapid injection of 5 cc. of 30 per cent urokon into the common carotid artery is accompanied by a sudden stinging, burning sensation in the homolateral side of the face and behind the eye. It tastes bitter and often induces the sensation of something flushing through the mouth, and the patient may desire to expectorate. A calm stoic patient will report it not to be painful but to burn as though on fire for an instant. In a small per cent of patients a moment or two later there may be nausea or actual gagging. This pain is considerably reduced when only 3 cc. is used, and the patient verbalizes little distress from the experience.

Although intracarotid injection of thorotrast is painless, it is retained in the body and may be seen years later in quantity in liver and spleen, and its malignancy provoking possibility has been indicted many times. Moreover, in a percutaneous injection any extravasation could lead to serious late cicatricial changes in the neck. Its use, therefore, may be justified only in elderly patients or severe hypertensives where the danger of immediate reaction is high. The newer media, hypaque and renograffin, are now receiving trial and show promise of being less irritating than 30 per cent urokon.

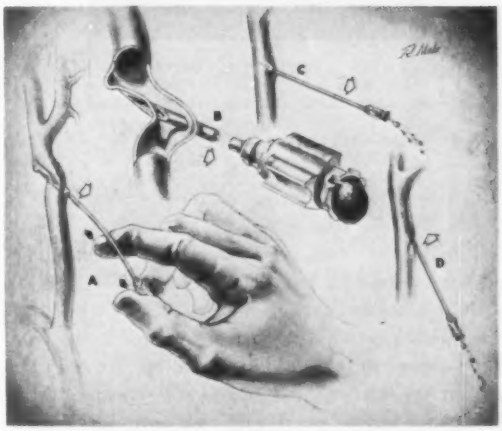

Fig. 5. Cannulating the artery (See text).

The performance of the test involves two steps: (1) the cannulation of the artery, and (2) the injection. For carotid angiography it is almost always the common, which is more accessible than the internal carotid artery, that is punctured. The demand for vertebral angiography is infrequent and the technique less dependable. Expertness in performing carotid cannulation ensures a minimum of pain and a maximum of safety and success. Although specially designed needles are preferred by some, an ordinary sharp No. 18 spinal puncture needle has proved adequate in this series. The operator first aims to transfix the artery with the needle, bevel down. *This necessitates fixing the artery against lateral or medial movement with perfect control.* If it

cannot be readily done between the fingers, the use of an accessory needle placed down to the transverse process medial to the artery against which it may be held, is of inestimable value (Fig. 4). Successful impaling of the artery is determined by slow withdrawal of the spinal puncture needle with its stilette out until a show of blood is seen at the open bore. After transfixation of the artery has thus been secured, the operator next aims at cannulating the artery as follows. Further slow withdrawal of the needle is continued and while doing so appropriate pressures are exerted against the needle to cause the artery to be raised up by the needle point (Fig. 5) until the needle is felt to "pop" into the lumen much as a needle "pops" through the dura in doing a lumbar puncture. This is accompanied simultaneously by a pulsating spurt of blood out of the needle, indicating the needle bevel to be entirely within the lumen of the artery. The needle may then be threaded up the artery a safe distance to insure total intraluminal injection of dye, usually one-fourth to one-half inches or more. The stilette is then replaced in the needle until the injection is ready to be made. The needle may be left in situ as long as needed.

Fig. 6. Angiogram (lateral view) made with 5 cc. of 30 per cent urokon showing large arterio-venous malformation. Note complete filling of early phase with only 5 cc.

The injections are made by attaching a 10 cc. plain tip syringe containing the contrast medium directly to the needle. Continuous irrigation of the needle system is thus safely omitted. Elimination of the irrigation system not only simplifies the technique, but enables the use of smaller quantities of dye. It is doubtful that uniformly successful angiograms can be obtained with as little as 3 to 5 cc. of medium if the dead space of irrigating tubing is interposed between syringe and needle. Moreover, facial petechiae which have been reported after this test do not occur when the irrigation system is eliminated. Evidently their occurrence indicates inadvertent injection of air trapped in the tubing. With the use of small quantities of dye (3 to 5 cc.), care must be taken not to allow blood to enter the syringe in any quantity before the injection is made unless the bolus of dye is diluted. The operator soon becomes proficient in how rapidly to inject the dye and when to make the exposures, and rarely misses obtaining appropriately timed films, both in the arteriographic and venous phases.

It is of interest that huge vascular lesions may be visualized in their entirety in all phases utilizing 5 cc. of dye or less (Fig. 6). It is also probably true that such large lesions may have greater than a 5 cc. total fluid capacity in their arterial or venous phases yet visualize completely with a smaller quantity of contrast medium. This may be due to the fact that the x-ray exposure is not instantaneous and visualizes the dye as it travels through the arterial or venous tree for a given period of time, if only brief. Cinefluorographic angiography[7] has shown with what rapidity blood flows through the cerebral vascular system. A quantity of dye insufficient to fill the entire arterial system in a given instance may, therefore, during a brief but finite interval, which is being filmed, fill out the entire vascular silhouette.

As a rule it is necessary to make only two injections, the first for an arteriographic view in the anterior-posterior projection, and the second for both arteriographic and venous phases in the lateral projection. The two phases may be obtained by manually changing the cassettes rapidly and making two properly timed exposures. Individual circumstances may vary this routine, however, since at times more than two injections may be needed where at other times a single injection for the anterior-posterior view may solve the problem in question. Interval phases between and after the arteriographic and venous phases may be needed for completeness in arteriovenous malformations or certain vascular tumors, and additional oblique views are often necessary for complete delineation of aneurysms. Flexibility with regard to the number of films and views needed

to answer the special needs of individual cases should be the keynote, bearing in mind at all times, however, that the fewer injections made the less likely the patient will react unfavorably. Adequate rest periods between injections are ordinarily provided if one waits to develop and view each set of films before proceeding with the next.

It is wise to take the lateral views on grid cassettes without turning the patient's head to offer less chance for the needle to be dislodged. This also simplifies the manual changing of cassettes for the two routine phases. The anterior-posterior projection, if taken with a 30° to 40° tilt as used in obtaining an occipital or Towne view of the skull, is apt to be more informative than a straight perpendicular projection, since then a longer view is obtained of the important midline pericallosal artery as well as the Sylvian vessels. Any shift from the midline of the former vessel is more evident in the longer view than when it is foreshortened as in a straight perpendicular view. Medial displacements of the Sylvian vessels away from the calvarium are similarly more evident in the longer occipital projection. Moreover, overlapping orbital and frontal sinus bony detail present in a perpendicular anterior-posterior film is thrown out of the field of the arteries in the occipital view.

If the time exposure is kept to one-fourth second or less, any movement that the patient may make in reacting to the injection will occur after the exposure is complete. He should be forewarned when the injection is about to be made. These precautions usually suffice in obtaining good quality films without motion, but occasionally head restraints or even general anesthesia are indicated.

The operator should be protected by a leaded shield placed over the patient's chin or neck between the needle and the rest of the patient's head, or by an extension cone or cylinder reaching nearly to the head which keeps the operator's hands out of any direct x-ray beam.

A percutaneous vertebral arteriogram technique as reliable, safe and simple as the carotid technique has not been developed. Success in obtaining good vertebral angiograms may be expected about 75 per cent of the time. Myelographic visualization of the main branches of the basilar artery system for aneurysms and displacement may be safely achieved by the use of the technique of Mellins,[8] but this is of limited value, although not difficult to accomplish.

On withdrawal of the needle following carotid angiography, immediate firm finger pressure at the site of puncture for a few minutes, which is somewhat uncomfortable, will prevent any significant hematoma formation. Greater care in this regard is needed in hypertensives and in the aged. Although a large number of minor hematomas in the neck have occurred, which contributes to the neck soreness which follows the test for a few days, none in this series has ever caused serious inconvenience nor have any had to be evacuated. Following vertebral angiography the site of puncture cannot be compressed, yet no ill effects following needle removal have been seen. It is recommended that the patient remain recumbent for two hours following angiography.

Summary

The author's experience with 500 consecutive cerebral angiograms performed in 364 patients is presented from the point of view of safety and yield of information. The total incidence of reaction was 6.6 per cent, but only 1.4 per cent for serious reactions, and the single death in which the test might be causally involved constituted an incidence of 0.2 per cent. Details of technique which enabled achievement of this record are discussed, including the recent use of 3 cc. of contrast media per injection.

Information critical for the diagnosis or the management of the patient was obtained in 172 of the 374 patients. In thirty-nine patients angiography alone without air study provided ample information for neurosurgical identification and localization of an intracranial mass or a surface hematoma.

Addendum

Since the preparation of this paper, more than 100 additional angiograms have been performed utilizing 3 to 4 cc. of dye per injection. Not a single major complication has occurred. Hypaque sodium (50 per cent) was used in almost all of this group and when injected into the internal carotid artery resulted in excellent contrast without producing pain. In 3 to 4 cc. quantities, it has become our medium of choice.

(Continued on Page 88)

Anomalous Left Coronary Artery and Endocardial Fibroelastosis

By John F. Sander, M.D.
East Lansing, Michigan

Ronald C. Peets, M.D.
Lansing, Michigan

TO THE PHYSICIAN whose practice is concerned with or limited to patients in the pediatric age group, sudden and clinically unexplainable death in a previously apparently healthy infant or child is a most distressing happening.

Farber,[1] in his timely work on this problem, refuted the myth of the thymus gland as the cause in itself of sudden death, and cast serious doubts on many of the other more or less accepted reasons for this highly disturbing occurrence. At the same time, Farber quite definitely established the roll of various fulminating and unrecognized infections as the almost universal cause of these "sudden deaths."

Recently, Adelson and Kinney,[2] in a comprehensive study of 126 consecutive cases of sudden unexpected death in children between the ages of ten days and two years, have again pointed up the almost universal role of severe fulminating infections in all instances of sudden death other than traumatic.

Two of the less frequently occurring and most often unrecognized causes for sudden or very rapidly occurring death in an infant who had previously given no clinical evidence of disease or anomaly, are anomalous left coronary artery and its counterpart in clinical course and manifestations, endocardial fibroelastosis.

This paper presents a review of the literature and cases of each of these uncommon conditions in which the ages, past histories and clinical courses were remarkably similar, and where diagnosis of the cause of their rapid demise was established only at the necropsy table.

Historical Data

The first report of anomalous left coronary artery was by Abrikosoff[3] in 1911. It was six years later that Heitzmann[4] reported an identical case and called attention to the similarity of the pathologic findings to those resulting from coronary occlusion in adults. In 1934, this entity was described in detail by Bland, Garland, and White.[5] It was from this report that the anomaly received its occasional name of "Bland—Garland—White Syndrome."

To this date, there have been approximately forty cases of this anomaly reported in the literature. All have essentially similar findings.

The companion entity, endocardial fibroelastosis, was first described in 1818 by Kreysig.[6] For a century it seems to have been either unrecognized or considered a facet of myocarditis. Then, in 1918, Potoschnig[7] reported this condition and suggested that it was noninflammatory and deserved further investigation. There appears to have been further lack of recognition of the entity until 1941 when Gross[8] reviewed the subject. Investigators then began to consider the condition with the congenital anomalies of the heart. It was given its present name by Weinberg and Himmelfarb[9] in 1943. Many more cases have been reported since that time, some of which were suspected clinically and verified at necropsy.

The Clinical Picture

The symptomatology of these two disorders is essentially identical. The infant, usually born normally at full term, appears normal at birth and for several weeks to months thereafter. Then the parents note the onset of attacks of pain, especially at the time of feeding. Respirations become short and grunty and the infant frequently pulls up his knees as if having colic. Later there is sweating, apparent shock and frequently cyanosis. It is now accepted that these attacks represent angina pectoris. Physical examination and chest roentgenogram show evidence of cardiac enlargement. Electrocardiogram shows signs of myocardial hypoxia as well as left ventricular hypertrophy. Cardiac catheterization has been of little help in distinguishing the two entities.

From the Departments of Pediatrics of the St. Lawrence and Edward W. Sparrow Hospitals, Lansing, Michigan.

Pathology

The findings at necropsy are characteristic. There is considerable enlargement of the heart, particularly of the left ventricle, due both to dilatation and hypertrophy. In the first condition, the changes are predominantly in the distribution of the left coronary artery. The endocardium of the affected area is usually thickened and gray, due to associated endocardial fibroelastosis. The left ventricular myocardium may appear scarred on gross inspection, and usually will exhibit scarring on microscopic examination. These are typical of scars due to myocardial infarction and, according to Bland et al,[5] tend to be concentrated near the endocardial side of the myocardium of the left ventricle. The myocardium will frequently also show focal areas of calcification. These are generally thought to be necrotic muscle. Acutely infarcted myocardium is sometimes evident. Endothelial-lined blood-containing sinusoids are frequently present in the myocardium of the left ventricle and these are quite striking when seen. The pathologic findings typical of endocardial fibroelastosis are essentially the same but without the anomalous coronary artery.

We wish to present one case of anomalous left coronary artery, and two cases of endocardial fibroelastosis for the record.

Case Reports

Case 1.—K. J., a four-week-old girl, was born normally of healthy parents. There were no other children. Her course in the hospital was uneventful. She was discharged in apparently good condition, and when examined two weeks later by her physician was in good condition and had made normal progress. When one month of age the parents reported that she was very fussy at feeding time. She would take about one ounce of formula and would pull up her knees and "scream" as though in great pain. She was given an appointment for office examination but shortly before that time the physician received an "emergency" call, stating the baby had another episode of severe pain, had vomited and then stopped breathing. Prompt and accepted attempts at resuscitation were of no avail.

Necropsy Findings.—Significant abnormalities were limited to the heart. The pericardial cavity was greatly distended and contained 85 cc. of blood-tinged fluid. The greatest transverse diameter was 4 cm.; the weight 42 grams. The coronary arteries were anomalous in that the left coronary originated from the pulmonary trunk. The left coronary was limited to the descending branch. The right coronary originated from the aortic trunk and was normal. The left ventricular wall varied in thickness from 5 to 7 mm.; the right 3 to 4 mm. The lateral aspect of the wall of the left ventricle exhibited an area of brownish discoloration 1 cm. in diameter lying beneath the endocardium and extending 2 to 3 cm. into the myocardium. The valves were grossly normal, as were other features of the heart.

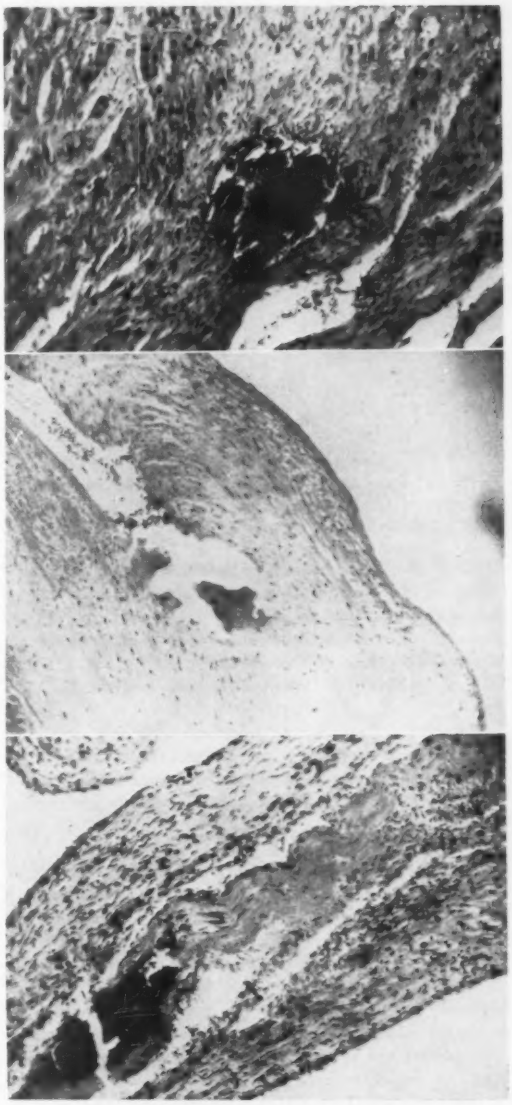

Fig. 1. *(above)* Case 1.—Myocardium showing the necrosis and focal calcification in ischemic areas.

Fig. 2. *(center)* Case 1.—Myocardium showing blood filled, endothelial lines sinusoids (x 150).

Fig. 3. *(below)* Case 1.—Papillary myocardium exhibiting necrosis and focal calcification.

Micropathology.—Myocardial fibers were hypertrophied, particularly of the left ventricular wall. There was a moderate amount of generalized interstitial edema.

Sections through the wall in the area of the above-described discoloration revealed several scars particularly beneath the endocardium. In several areas there was necrosis of the myocardial fibers. There were focal

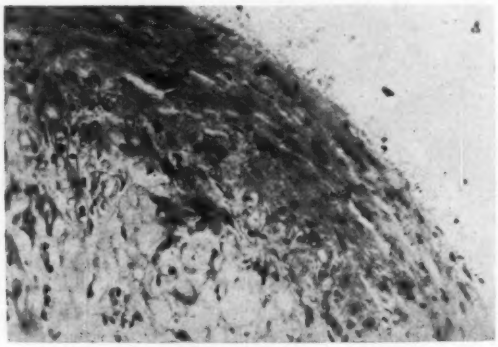

Fig. 4. Case 2.—Ventricular myocardium exhibiting endocardial fibrous thickening and vacuolization of underlying myocardium.

areas of calcification among the necrotic muscle bundles. Many of the papillary muscles exhibited focal areas of necrosis and calcification. The endocardium in the areas of myocardial involvement was greatly thickened due to an excess of fibrous and elastic tissue. There was no evidence of inflammatory cell infiltration.

Pathologic Diagnosis.—Anomalous origin of left coronary artery from the pulmonary trunk. Coronary artery insufficiency and acute myocardial infarction. Cardiac hypertrophy, dilatation and acute congestive failure.

Case 2.—H. U., a five-month-old, white female child was born by normal spontaneous delivery after a normal pregnancy. No physical abnormalities were noted in the postnatal physical examination. Both parents were in good health. A two-year-old brother, normal and in good health, was the only sibling. She was examined regularly at monthly intervals according to accepted pediatric standards and her progress was good. Her mental and physical development were normal. She had no illnesses until she was five months old, at which time she had an acute adenotonsillitis, uncomplicated. She received penicillin therapy and routine symptomatic treatment. Her clinical improvement was prompt and satisfactory for four days, but then she again became febrile, irritable and anorexic. She vomited persistently. Her physician was called on the fifth day and when she was seen was extremely and critically ill. Her color was ashen gray, respirations were rapid, grunting, and labored. Breath sounds were bronchial in character over both upper lung fields more marked on the left. Clinical diagnosis of pneumonia, and dehydration was made, with the possibility of previously unrecognized cardiomegaly.

The infant was promptly hospitalized; placed in oxygen, parenteral fluids started, and she was given streptomycin-penicillin therapy.

Chest roentgenogram showed marked cardiac enlargement involving chiefly the left side of the heart, and bilateral bronchopneumonia.

She remained cyanotic and had increasing respiratory distress, even in high oxygen concentration, and expired six hours after admission.

Autopsy Findings.—Pathology was limited to the heart and lungs. Both ventricles were markedly dilated.

The mitral valve leaflets and the endocardium showed white fibrous thickening. Microscopically there was edema of the interstitial connective tissue, of the myocardium and patchy fibroelastosis throughout. The endocardium was thickened by fibrosed elastic fibers. Bundles of atypical clear cells were found beneath the endocardum. The mitral valve leaflets were thickened and showed both fibrosis and degenerative changes.

The lungs exhibited a patchy consolidation of all lobes, which microscopically proved to be entirely edema.

Pathologic Diagnosis.—Myocardial failure due to endocardial and myocardial fibroelastosis.

Case 3.—C. C., a five-months-old, white male infant, was born by normal spontaneous delivery after a normal pregnancy. The mother was Rh negative. Cord blood was Coombs negative and showed a bilirubin of 1.7 mg. per cent. Growth and development were normal during his five months of life. He became ill during the day prior to admission with persistent vomiting, was restless and irritable and cried constantly. The following day his physician was called and he felt that the child's condition was critical, and advised immediate hospitalization. His temperature was 104° rectally on admission. He was cyanotic, respirations were rapid and labored, and breath sounds were bronchial in character over both upper lobes but more marked on the left. Parenteral fluids, oxygen and vigorous antibiotic therapy was started, but he expired one and one-half hours after admission.

Autopsy Findings.—The pericardial cavity contained 30 cc. of straw-colored fluid. The heart was markedly enlarged and when emptied of its contents weighed 108 grams, with the greatest transverse diameter being 6.5 cm. The coronary arteries were normal in origin and distribution. The myocardium was hypertrophied and flabby. Both ventricles were markedly dilated. There were no anomalies of the heart or great vessels. The endocardium was opaque, white and thickened.

Microscopically the myocardium of the left ventricular wall showed marked hypertrophy of uneven distribution. The endocardium of the left ventricle was markedly thickened. There were numerous trabeculae of dense connective tissue extending into the myocardium with partial degeneration of some of the myocardial fibers. There was no myocardial infarction, nor any inflammatory myocarditis or endocarditis. The lungs, liver, spleen and kidneys showed marked congestion.

The pathologic diagnosis was congenital endocardial fibroelastosis with left ventricular cardiac hypertrophy and acute congestive heart failure.

Comments and Summary

Sudden and unexpected death in an apparently previously healthy infant or child is a most shocking and distressing occurrence to both the physician and the family. For years most of these sudden deaths were attributed to hypertrophy of the thymus gland and/or status thymico lymphaticus. Since 1924 when Farber first refuted this then current and accepted cause of death, and established fulminating infection as the most universal cause of all sudden, other than traumatic deaths, numerous articles have been published confirming his findings.

Three cases of sudden, unexpected and clinically unexplained death are reported by us, which are neither on a traumatic or infection basis, and which indicate that in any similar situation, the possibility of endocardial fibroelastosis or anomalous left coronary artery should be included by the physician in his differential diagnosis.

Acknowledgment

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DIAGNOSIS OF PHEOCHROMOCYTOMA

(Continued from Page 71)

potassium levels. Finally, the occurrence of an attack immediately following Regitine at first seems paradoxical but probably represents a reaction to the transient hypotension produced immediately following the injection.

Conclusions

1. A routine screening procedure for the diagnosis of pheochromocytoma is presented.

2. Emphasis is placed on the measurement of urinary catechol amines to confirm apparent positive pharmacologic tests.

3. Specific procedures to be performed by patient or physician during a suspected attack are outlined. The possible diagnostic usefulness of electrocardiographic changes during an attack are pointed out on the basis of our experience with one such case.

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Diagnosis of the Operable Arterial Lesion

By Herbert J. Robb, M.D., and
Charles G. Johnston, M.D.
Detroit, Michigan

REPLACEMENT of diseased arteries has become a fairly common practice. Accordingly, many individuals who formerly had to live with an arterial incapacity may now be safely and adequately treated by means of surgery. This development has come within the past few years. Formerly, such replacement was possible only in institutions where it was possible to obtain fresh homografts promptly when needed, and under aseptic conditions. With the discovery of methods for preservation and sterilization of homografts, arterial replacement has become more practical. Many of the lesions which would be untreatable, were it not possible to replace the defects resulting from resection, have become operable.[1] The conditions which have become suitable for treatment by use of the arterial homograft are briefly reviewed below, in conjunction with a practical method for arteriography and reference to a practical arterial bank.

Aneurysms

Aneurysms are an important group of conditions in which homografting has made remarkable differences in therapy. They may be classified according to cause as secondary to trauma, arteriosclerosis, syphilis, and mycotic disease. According to shape, they may be saccular, fusiform, dissecting, miliary, or cirsoid. For the purpose of treatment and diagnosis, they are best discussed according to location.

Thoracic aneurysms[2,3] are located in the ascending aorta in 70 per cent of the cases, according to Kampmeier. The association with syphilis has been common. They cause symptoms by pressure against the esophagus, trachea, left recurrent laryngeal nerve, and erode into the vetebrae. Accordingly, symptoms of dysphagia, hoarseness, difficult breathing, and back pain develop. A tracheal tug may exist. Signs of dullness over the chest and dilatation of the aortic valve may be present. X-ray studies of the chest will usually be diagnostic, demonstrating the size and calcium deposition in the wall. Transthoracic aortography as well as angiocardiography have been used. The average survival after onset of symptoms is six to nine months, frequently terminating with hemorrhage. In the past, treatment has been in the form of wiring or wrapping with cellophane. Currently, resectional therapy with grafting has been reported.

Dissecting aneurysms[4] most frequently begin as a primary tear of the ascending arota in advanced arteriosclerosis, dissecting within the layers of the media. The onset is usually sudden with agonizing tearing pain in the thorax and intercostal distribution. Interference with the blood supply of the spinal cord may produce paralysis. Pain often progresses distally with the development of shock, and the loss of pulses in variable peripheral arteries. DeBakey and Cooley have treated these by the creation of a re-entry passage into the aortic lumen above with the obliteration of the false passage below. Results are encouraging.

Abdominal aortic aneurysms[5,6] nearly always develop distal to the renal vessels, and are usually arteriosclerotic in origin, occurring in the age group past sixty years. They may extend into either or both common iliac arteries, on occasion obstructing one or both ureters. Symptoms may be minimal, frequently with low back pain. Abdominal pain usually indicates slow perforation or leakage of the aneurysmal sac of varying severity and rapidity. They present themselves as palpable pulsatile masses at the level of the umbilicus, usually lying slightly to the left. A hand placed on each side will give the impression of width and lateral pulsation. The scout film of the abdomen may show a rim of calcification, and the pyelograms lateral displacement of the ureters. Translumbar aortography may confirm the suspicion, although the lamination of clot frequently prevents adequate filling to indicate the full size of the aneurysm. Resectional surgery with replace-

From the Department of Surgery, Wayne State University College of Medicine, Detroit Receiving Hospital, and Veterans Administration Hospital, Dearborn.

ment by a homograft or plastic prosthesis is the current generally accepted treatment. Survival is 80 to 85 per cent in elective cases. Acute rupture of the abdominal aneurysm is recognized by acute abdominal pain and peritoneal tenderness accompanied by shock in an individual with a pulsating abdominal mass. Emergency surgery with the replacement of the aorta gives a variable 50 per cent survival.

Peripheral aneurysms[7] have occurred in all major arteries of the neck and extremities. They are secondary to trauma, as gunshot wounds and stab wounds. Arteriosclerosis is a frequent cause in the popliteal region. The mycotic variety occurs in individuals with bacterial endocarditis. A localized, expansile, pulsating, swelling develops over one of the arteries. Auscultation reveals a systolic murmur. Pressure on the artery proximal to the sac will decrease the murmur, size, and pulsations. An arteriogram is of value. Thrombosis, embolism, gangrene, pressure on veins and nerves, and rupture are possible sequelae. Treatment consists of endo-aneurysmorrhaphy, or excision with grafting by an autogenous vein or homologous artery.

Occlusion

Superficial femoral occlusion[8,9] may involve all or only a portion of this vessel, frequently first developing in the region of the distal adductor canal and progressing proximally to the deep femoral artery. Symptoms are those of calf claudication with mild exercise. Ankle or foot ulcers may develop and be confused with varicose ulcers. They are frequently on the toes or on the lateral ankle instead of over the medial malleolus. The dorsalis pedis, posterior tibial, and popliteal pulses are absent or feeble. The popliteal pulse can frequently be best palpated with the patient lying on his abdomen and the knees flexed at 45°, using the foot of the bed to support the feet so that the hamstring muscles can be relaxed. Unless there is a higher obstruction, femoral pulses will be present and of good quality. Femoral arteriography will determine and record the extent of the obstruction. Replacement or by-pass by a homologous artery or autogenous vein is indicated if a patent popliteal segment is present.

Iliac and/or femoral occlusion[10] may exist on one or both sides with or without a patent superficial femoral vessel. All the signs of arterial insufficiency existing in the superficial femoral artery occlusion will be present. In addition, the femoral pulse is absent or feeble, or the thrombosed vessel is palpable. The immediate aortogram will show the block and a delayed "aorto-femoral" arteriogram should demonstrate the collateral and possible distal communication with the superficial femoral vessel. For years, sympathectomy has been the treatment of choice; but this was usually only temporarily palliative. Currently a homologous graft to by-pass the obstruction is indicated, providing a patent distal segment exists. We have used grafts up to 55 cm. with good results to restore arterial flow and eliminate claudication.

Abdominal aortic occlusion[11] may occur in varying degrees and extend distal to the renal arteries with or without occlusion of the iliac and femoral arteries. As such, it was described by Leriche in 1940. There is intermittent claudication of the calves, thighs, buttocks, and lumbar region with a sensation of coldness and numbness of the extremities. Impotency may exist with bilateral, internal iliac involvement. There may be loss of hair, with skin and muscle atrophy. Pulses of the femoral, popliteal, dorsalis pedis and posterior tibial region are absent or occasionally feeble. Oscillometric readings and skin temperatures are useful in determining the degree of arterial insufficiency. Translumbar aortography is indicated to determine and record the extent of obstruction. Resection of the aortic bifurcation with an arterial homograft, or on occasion, a plastic prosthetic replacement, should be considered. Thromboendarterectomy is used on occasion. Lumbar sympathectomy may be added but there is some question of its advantages.

Occlusion of the thoracic aorta[12] occurs as a coarctation either proximal or distal to the ductus arteriosus. If the ductus is distal to the coarctation, it is of the infantile type and prognosis is poor, usually with death in infancy. If the ductus is proximal, as in the adult type, the collateral circulation will develop and prognosis is favorable. In the adult type, the lower extremity pulse and pressure are diminished and the arm pressure is increased. Cardiac decompensation, hypertensive headaches and nose bleeds occur. Notching of the ribs usually does not occur until after childhood. X-rays of the chest may demon-

strate the rib notching and cardiac enlargement. Resection and re-anastomosis, with or without a homograft, is indicated to prevent intracranial hemorrhage and progressive cardiac failure.

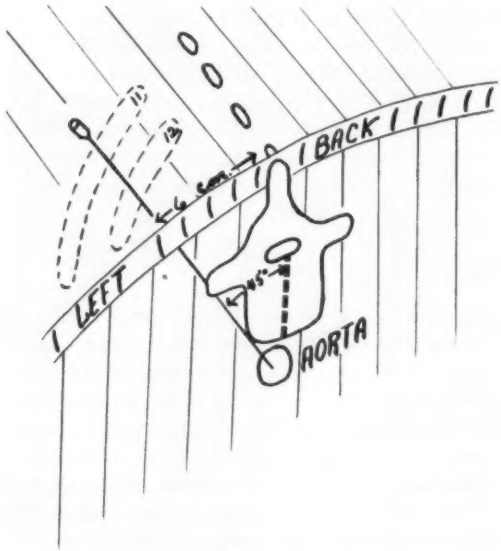

Fig. 1.

Fistulas

Arteriovenous fistulas[13,14] occur as single or multiple connections between the arteries or veins, and may be congenital or traumatic in origin. In the chronic form, depending on the size of the fistula, there is a fall in diastolic blood pressure, increase in venous pressure, dilatation of the veins, and proximal artery. In the limb, there will be an increase in temperature, stasis, pigmentation and ulceration. Acutely, there may be a distal decrease of temperature due to the shunting of the blood away from the distal capillary beds. The oxygen content of the local veins will be high. An increase of circulating volume will occur. Compensatory enlargement of the heart will occur in large or long standing fistulas, progressing on occasion to myocardial failure. A thrill and bruit continuous throughout the cardiac cycle are present. Compression and closure of the fistula will lead to a decrease in pulse rate and elevation of blood pressure. Arteriography is diagnostic with immediate return of dye toward the heart. Closure will rarely occur spontaneously in a large fistula; death may occur from cardiac failure. A venesection is to be considered at the time of closure to prevent severe rise in diastolic pressure and acute cardiac failure. Bacterial endartiritis may occur on occasion. The effects of an acute arteriovenous fistula[14] are those of hemorrhage, with a drop of blood pressure, increase of pulse rate, decrease of heart size, increase in venous pressure and increase in cardiac output.

Embolism

Arterial embolism[15] is most frequent among individuals with auricular fibrillation. The embolus may follow any arterial path and stop at a site where the arteries bifurcate and narrow, as at the distal end of the popliteal, femoral, aortic or auxillary arteries. The embolus is a hard white thrombus distal to which develops a soft red clot. The part distal to the occlusion will become pulseless, cool, then blanched and/or mottled. Effort to move the extremity will demonstrate weakness and pain. It may later become numb if the block is complete. Emergency embolectomy is indicated even though some time has passed when the patient is first seen. Paravertebral sympathetic blocks are useful to increase the collateral but should not be depended upon. Frequently, one femoral pulse is absent; and exploration of that artery produces a questionable flow of blood. In such a case, abdominal exploration will usually show a thrombus at the bifurcation of the aorta lying to one side, allowing blood to enter the opposite iliac vessel. Following surgery, a second embolism may occur requiring repeat surgery. Removal of the left auricular appendage may be indicated to prevent recurrent emboli occurring from this site.

Diagnosis

Aortography[16,17,18] is important in the diagnosis of the above arterial lesions. Numerous modifications of technique have been used. Briefly our method is as follows (see diagram): With the patient face down on the table, under spinal anesthesia, we insert a No. 17 gauge, 7-inch needle four to five fingerbreadths to the left of the spinus process beneath the twelfth rib, at a 45° angle with the saggital plane toward the midline. If a transverse process is encountered, the needle must be backed off, angled superiorly or

inferiorly, and reinserted until it meets the vertebral body. It is then moved anteriorly on the vetebral body until it passes in front of the vertebrae. Approximately a 1 cm. thrust will meet resistance, then loss of resistance as it enters the aortic lumen. Normally, a 1 to 2-inch pulsation of blood will appear on removal of the stylet. A rubber catheter connection is attached and a 4 cc. quantity of 70 per cent Urokon is injected for a test picture to check the position of the needle and test the patient for sensitivity. Mild nausea is frequent. If the needle is in the renal artery or superior mesenteric artery, it must be withdrawn and re-inserted, as a full injection of dye into these vessels may well lead to thrombosis and undesirable complications. When the needle has been thus checked, the Bucky film is placed so as to include the tip of the needle and the bifurcation of the iliac vessels on the film. A 20 cc. quantity of 70 per cent Urokon is injected as rapidly as possible, and an exposure is taken as the last 3 cc. is injected. The needle and tubing is filled with physiologic saline until the film is developed. If the arteries are patent to the femoral level, a transaortic femoral arteriogram or what might be called an "aorto-femrogram," may be taken to demonstrate both superficial femoral arteries down to the popliteal level. This is usually accomplished by means of a three-second delay in x-ray exposure after the injection of the dye when no proximal block is present. If the block is found at any point from the aorta distally, a four to eight-second delay of exposure may be necessary before the dye appears in the patent artery distal to the block, if such exists. This radiograph is desirable and can usually be obtained, as a distal patent artery will fill through collaterals. If the distal artery is open, surgery is usually indicated. We have used up to 60 or 80 cc. of Urokon in 20 cc. injections to obtain the necessary information. Direct femoral arteriography is not often indicated in sclerotic vessels, as injury may be sufficient to cause thrombosis. Where necessary, we use a 30 per cent Urokon solution injected through a polyethylene catheter which has been inserted through a large bore No. 16 gauge needle. The needle is then removed, leaving the polyethylene tube in place. If necessary, repeated injections may thus be made without injury to the artery through motion of the needle.

Treatment

The artery bank[19,20] represents a primary prerequisite for the treatment of the operable arterial lesion. Until recently, it was necessary to obtain homologous arteries for grafting purposes within six hours after death in bodies without systemic infection or disease. Transfer of the body to the operating room and removal of the vessels under sterile conditions was inconvenient and took more time than the pathologist and undertaker were willing to give.

Recently, methods have been devised to sterilize the homologous artery which is removed at the routine postmortem examination. We feel that the most practical artery bank is that developed by LoGrippo and Szilagyi with the use of Beta-propriolactone to facilitate sterilization of the arteries. The routine postmortem examination permits have been changed so that special permission and a signature may be obtained for the removal of arteries to be used as homologous grafts Permits are requested on all bodies up to sixty years of age and on all malignant and septicemic diseases except those which are viral in type. Vessels then may be removed at the time of autopsy at the discretion of the pathologist, depending solely on their quality. They are taken from refrigerated bodies up to twenty-four hours after death. The aorta from above the renals is removed, including the bifurcation, and both ilial and femoral vessels down to the popliteal level. Polyethylene tubing is best left in the internal iliac, profundus and popliteal vessels to facilitate embalming, and encourage co-operation from the undertaker. The vessels are then cleaned by the surgical resident on pathology and placed in saline solution for transfer to the artery bank; where, within three to four hours, they are sterilized with Beta-propriolactone. The method is relatively simple and requires little more than the refrigerator for storage, laboratory glassware, and a controlled temperature water bath, or incubator. Following sterilization, the Vessels are stored at 4° C. in Hanks solution with penicillin and streptomycin added. The aortic bifurcation, right femoral, and left femoral segments are each stored separately, so that each donor may easily be used for as many as three or more arterial grafts. The homografts are usable up to thirty or forty days, after which they may be lyophilized for further storage. We have taken vessels from

sixty-two such bodies and have found them in every case to be sterile, with all qualities remaining necessary for a good homologous graft.

Summary

With the development of a practical method for the preservation of the homologous artery, diagnosis of the operative arterial lesion has become important. The clinical history will usually indicate the presence of probable arterial disease, but x-ray with arteriography is of greatest value in the exact location and definition of the lesion. Surgery of a curative nature can then be planned and accomplished.

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CEREBRAL ANGIOGRAPHY

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612 Kales Building

Detroit 26, Michigan

Detecting Glycosuria

Comparison of Three Preparations for the Detection of Sugar in the Urine

By Joseph D. Mann, M.D.
Grand Rapids, Michigan

TWO COMMERCIAL preparations designed to detect glucose in the urine have been introduced recently. The only available information regarding these preparations comes from the sponsoring companies. Both new methods employ paper strips impregnated with glucose oxidase and an appropriate indicator system. Specificity, sensitivity and simplicity are claimed by the manufacturers. We have compared the performance of these preparations with each other and with a more familiar commercial method which is essentially the Benedict reaction.

Methods

Urine specimens obtained from hospitalized patients were studied by three methods—"Enzyme A"*, "Enzyme B"** and a "Reduction Method"†. Some specimens were obtained from diabetic patients, others were secured following intravenous infusion of glucose and fructose, or during the course of glucose tolerance tests. A small percentage were derived from cases of renal glycosuria or lactosuria. Fermentation studies were carried out and the patient's clinical records were reviewed when necessary to establish the cause of the glycosuria. One or more test was positive in 506 specimens. Blood sugar findings, when available, were correlated with the urine findings. Tests were performed by several different technicians according to the manufacturer's specifications.

Results

In the majority of instances all three tests were positive. "Enzyme B" was the only positive test in 15 per cent of the specimens (Table I). In every such case the degree of positivity was 1+. All such specimens tested showed a positive fermentation reaction. They were largely obtained during the course of glucose tolerance tests or after intravenous administration of glucose. The "Reduction Method" was the only positive test in 10.7 per cent of the specimens. Most of these specimens either did not show a positive fermentation reaction or were derived from patients who had received intravenous fructose. In no insance was "Enzyme A" the only test positive; in no case was the "Enzyme A" test positive and "Enzyme B" test negative. However, the "Reduction Method" and the "Enzyme B" methods were both positive while the "Enzyme A" method was negative in 3.8 per cent of specimens.

TABLE I. PERCENTAGE OF POSITIVE TESTS FOR URINARY SUGAR OBTAINED WITH THREE COMMERCIAL PREPARATIONS OF 506 URINE SPECIMENS

Method			Per Cent of Tests
Reduction	Enzyme A	Enzyme B	
+	+	+	60.6
+*	0	0	10.7
0	+	0	0.0
0	0	+	15.0
+	+	0	0.0
+	0	+	3.8
0	+	+	9.9
Total			100.0

*Not fermentable or specimen obtained after intravenous administration of fructose.

The manufacturers of "Enzyme A" do not claim that the color reaction of their preparation can be quantitated.†† On the other hand, the manufacturers of "Enzyme B" supply a color chart designed to permit semiquantitative reporting of the test. Comparison of the degree of positivity reported by the "Enzyme B" method and the "Reduction Method" reveals a rough correlation between the two techniques (Table II). The "Enzyme B" test is somewhat more sensitive and the units of positivity do not correspond exactly between the two techniques.

From the Department of Pathology, Butterworth Hospital, Grand Rapids, Michigan.

*"Clinistix" (Ames Company, Elkhart, Indiana).

**"Testape" (Eli Lilly & Company, Indianapolis, Indiana).

†"Clinitest" (Ames Company, Elkhart, Indiana).

††Personal Communication, Ames Company, Elkhart, Indiana.

TABLE II. COMPARISON OF THE DEGREE OF POSITIVITY REPORTED IN 506 POSITIVE URINE SPECIMENS BY THE "REDUCTION METHOD" AND BY "ENZYME B" METHOD

Reduction		Enzyme B				
Degree of positivity†		0	1+	2+	3+	4+
	Corresponding Per Cent Sugar	0	0.1	0.25	0.5	2.0
0		—	127	3	—	—
trace	0.25	48*	61	23	5	—
1+	0.50	6*	10	26	14	—
2+	0.75	—	—	12	26	8
3+	1.00	—	—	—	12	41
4+	2.00	—	—	—	2	82

†According to manufacturer's specifications.
*Not fermentable or specimen obtained after intravenous fructose.

Comments

In this series, "Enzyme B" appeared to be more sensitive than "Enzyme A." The "Reduction Method" compared surprisingly well in sensitivity to the "Enzyme A" test. Both enzymatic methods appear to be specific for glucose. The Benedict reaction has the doubtful advantage of detecting nonglucose reducing substances.

The semiquantitative color chart supplied by the manufacturers of "Enzyme B" introduces a problem to the clinical laboratory and to the clinician. According to the manufacturer's specifications and in the actual practice (Table II), the degrees of positivity obtained by the "Enzyme B" method are different from the familiar system obtained with the Benedict reaction. The clinician must revise his thinking if the new standards are employed. The clinical laboratory must clearly indicate which method is being used and what the degrees of positivity mean.

For the present, we propose to retain the Benedict positivity scale with which the clinician is familiar and use also the enzyme test to obtain additional sensitivity and specificity. Specimens which are positive by the enzyme test and negative by the reduction test will be reported as "faint trace." Use of the enzyme test will reduce the need for fermentation tests in the identification of sugars in the urine.

Acknowledgment

The technical assistance of Mrs. Miriam DeLange and co-workers is gratefully acknowledged.

INTERATRIAL SEPTAL DEFECT

(Continued from Page 60)

normal. Eight months following operation the patient is well with normal examination and function.

Comment: This is an example of an ideal candidate for this procedure.

Summary

Interatrial septal defect is a frequent congenital abnormality of the heart. It usually causes death in the fourth decade due to progressive changes resulting from the left to right shunting of blood in the atria. It is surgically correctable, often by closed procedures. Childhood is the safest and most effective time for the surgical correction. The physiology of the defect is discussed. Three cases are presented to illustrate results of surgical treatment in the various stages of this anomaly.

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President's Message

I Challenge You

To assure the provision of medical care security, in a form acceptable to both the public and the medical profession, an awareness of existing approaches, what is being planned, and a constant re-evaluation, must be maintained.

The time for complacency on the part of our profession is over. We have reached a crossroads where default in leadership becomes final. Ostrich-like satisfaction with an undisturbed status quo can become an enmeshing quicksand.

On the other hand, if we are sincerely to assume our rightful and traditional responsibility for determining how our patients shall receive medical care, we must ascertain what is desired and needed in the way of medical care security.

Already schemes for such security are in existence, or being planned, by lay persons and organizations. This is being done without prior consultation with the profession and without regard for our plans.

If we were to concede the propriety of non-professional groups concerning themselves with medical security, we still would not accept their usurpation of responsibilities which are solely ours.

A basic difference in viewpoint exists between these groups and our profession. Their programs at best can only be financing and administrative mechanisms. They cannot supply a means of furnishing service because medical care can be provided only by physicians. It is difficult to see how so personal a relationship as that of physician and patient can be equated with the measured cadence of efficiency-ruled automation. Yet that is the essence of what is being advocated by some lay groups. They reject free choice service in favor of totally group practice. They propose salaried physicians or a capitation fee and, in doing so, give a newly-tailored definition of "free choice" to fit the circumstances.

Most members of MSMS are at least vaguely aware that some of their fellow physicians maintain close contact with this vital and absorbing subject of prepayment medical care. Credit is overdue to MSMS officers, Councilors, and members of the Michigan Medical Service Board, for their unremitting attention to this subject. But it is not enough that so small a percentage of our members are conversant with this tremendous problem. It is of utmost importance that *all* members become familiar with it.

I challenge you, as a member of MSMS, to avail yourself of the plentiful material on the economics of medicine. If the profession is to withstand powerful onslaughts and unwarranted usurpation upon our ideals and principles of professional practice, we must have a united front. Only by an informed membership, only by you knowing what is going on, can the necessary evaluation of medical care plans meet the needs of the times.

Arch Walls M-D

President, Michigan State Medical Society

Editorial

CONGRESS AND MEDICAL LEGISLATION

The Congress for 1957 will be considering a host of new bills having a direct or remote interest to the medical profession. This would be a wonderful time for the doctors to sponsor a few basic actions which would make the going easier, would immediately benefit our public, and would serve to annul the traditional role in which we have been so frequently cast for the past three decades.

The profession has made most of its imprint on the Congress by opposition to certain bills. It started during the thirties when we had the perennial Wagner, Murray, Dingell bills. That fight was long and bitter but placed us always "in opposition." The late Senator Taft offered his version of a medical program after consulting with the late Senator Vandenburg and many of the doctors. We were asked to make suggestions, and for a long time it seemed the profession could be known by what it advocated.

It is late this year, but a program of beneficial bills could be started any time and would be a stroke of good business. Several bills of general importance could well be promoted.

JENKINS-KEOGH

Another Jenkins-Keogh bill is almost certain to be introduced in the next session of Congress. It would benefit almost all self-employed persons. The last session of Congress came near passing one—failing because someone was not on the job at a critical moment to include it in an emergency act which was cleaning up many loose ends. Under various names, these Jenkins-Keogh bills have been under consideration for many years. The advocates of this legislation are asking only for an equal chance in the income tax field, with six times their numbers who are employed in industry.

The American Bar Association and the American Medical Association have been advocating such legislation as the Jenkins-Keogh bill since about 1950 and will undoubtedly continue.

Every industry may favor its salaried or wage-earning people by depositing for them, in addition to their wages, a set sum (and it can be large) to buy or provide retirement annuities. Thus much larger incomes are available beyond the income tax restrictions. The employe pays his income tax (it is withheld), and that tax is only on the basic rate. The annuity money is not his until years later, and industry may charge this amount off as expense just the same as though it had been used to increase the wage. There are two benefits to industry, and good laborers are kept employed because of established benefits which would automatically be cancelled if a change of employer occurred.

Income taxes in our modern time have become so high it is almost impossible for a person after paying his tax to accumulate enough to establish income bearing holdings. The tax rate starts at twenty per cent, and increases with every step until a maximum of 92 per cent (which is confiscatory) is soon reached. Many of our self-employed are professional—doctors, dentists, architects, lawyers, musicians, preachers, and small business operators. Their earning power is slow to develop but lasts for relatively few years, not long enough for them, with the meager amount left after taxes and living expenses, to purchase enough endowments so their after retirement income even with the added social security, can provide even the most modest living.

Our friends in industry who apparently have been earning about the same or even less than we, have been provided for out of so-called "expense of doing business money," and without tax. That cost has not helped government and has increased the cost of doing business. We, the self-employed, have not benefited but have helped pay.

Our many friends in industry have been able through their employers' wise tax-free investments, to build a substantial retirement annuity which the self-employed individual should, but is not able, to do.

THE JOURNAL has commented on this subject at least once a year since September, 1948. The self-employed are asking no special privilege—simply to be placed on the same benefit level as their friends in industry.

HEALTH REINSURANCE

The President, in his messages on the state of the nation, for several years has advocated what was called "reinsurance." He was interested in arrangements by which the voluntary medical and hospital prepayment plans could provide needed health insurance to persons in the lower income levels, who were prevented from buying the same health benefits so many millions of our people have been doing in ever-increasing amounts. This proposal was called "reinsurance" and consisted of advancement by the government of at first $50,000,000, and contributions by each subscriber plan of suggested amounts to the common fund operated by the Department of Health, Education and Welfare. If service experience provided a deficit after caring for these persons, the amount would be forthcoming from the common funds. It was stipulated that contributions of the subscribers be so arranged periodically that the total amount would pay off all amounts advanced, and the government would have its $50,000,000 back at the end of five years.

This amounts to a subsidy pure and simple, instead of reinsurance, but demands the subsidy back at the end of five years. Actually, under the plan the subscribers, Health Insurance Voluntary groups, were being asked to take non-eligible subscribers and pay the losses ultimately themselves. The only out would be to go through the form of a subsidy by HEW, but actually to secure the money in some method from the ordinary subscribers.

Assistant Secretary Roswell Perkins, author of the administration's reinsurance program, is leaving the department. We probably shall not hear much about reinsurance this session—we hope.

MEDICAL EDUCATION

The costs of medical education have not in any way decreased. It was estimated a few years ago that another $10,000,000 is needed every year by the medical schools in addition to the amounts now available from tuition and state supports, private endowment and other sources. The Federal government has offered to make funds available. The American Medical Association has not objected to one-time provision of funds for construction, but has been apprehensive of anything in the nature of a subsidy, fearing loss of administrative control by the medical schools. Bills will undoubtedly be introduced which must be studied for hidden intent. We fear what might occur in the future if subsidy has encroached on our most cherished right.

Medical research will naturally come under medical education and the amounts to be provided are multiplying each year. For the current fiscal year ending July, 1957, the amount of about $225,000,000 has been appropriated.

MEDICAL DRAFT

The special draft law for doctors of medicine and dentists is due to expire July 1, 1957. In the past, it has been extended by simple act of Congress when a need seemed apparent and the quota of medical corps officers was difficult to obtain from the newly graduated; also experienced officers were in demand. The general draft for all persons expires at age thirthy-six, or maybe now twenty-six, but for doctors it starts when they graduate and extends until they are fifty-one. No other category of persons is subject to such special and exacting control. In justice, the law should be repealed and should not be reenacted. It is purely class legislation Some other method should be used. Many of our doctors were sent to school by the government and were required to promise only a short term of duty. In justice, a sufficiently long enlistment is indicated to reimburse the government for free education.

GOVERNMENT EMPLOYES' INSURANCE

For several years, Congress has been considering some action to provide health insurance for its civilian employes but has never seemed to find the solution. Many bills have been introduced, but always some snag developed or the impelling interest has faded. The last Congress might have succeeded but stumbled on the problem of payroll deduction. Congress asked a study to be made under the supervision of the General Accounting Office to determine the added cost and feasibility of such a service.

Congress is suddenly apprehensive of the added expense of making payroll deductions in its own offices to pay for health insurance, but never hesitated when it appointed every employer of labor to be its collecting agent in the income tax withholding burden. Michigan Medical Service and the Blue Cross might have been serving the postoffice employes in Michigan for many years,

if some way could have been arranged for payroll deduction. The department refused, saying such deductions were illegal, but did withhold income tax. We have suggested to different congressmen that a simple act authorizing payroll deductions for certain purposes, such as Community Chests, national welfare movements or health insurance, would put the government agencies in the same relation to their employers as industrial employes.

We anticipate government will provide for some form of voluntary prepayment health insurance of government employes in the coming session of Congress. We believe this to be very proper, but we suggest our representatives in Congress be guided in their efforts so that our medically sponsored plans will be given a chance. The wording and intent of the bill may be of significant importance, also the willingness to do something.

MICHIGAN LEGISLATION

On the home state scene, there are some points of legislative action which we should be known as advocating instead of opposing. It has been shown that Michigan imports 250 graduates in medicine each year because our own medical schools cannot supply the demand. The Wayne State University Medical School now could accept about fifty more students in each class, if money for more teachers were available. Our House of Delegates, in September, 1956, passed a resolution urging the State to accept this obligation. We can heartily support such a bill.

THE YEAR 1956: MEDICARE

The year 1956 has been one of extremely significant accomplishment. The most outstanding is the action of the government in providing medical care for the dependents of military personnel. Such care has been available traditionally, but only at military hospitals where the family was stationed. With business booming as it is, it is becoming increasingly difficult to keep the military strength up to what is required, especially the more experienced and necessary personnel. The draft helps, but does not hold the older men in service.

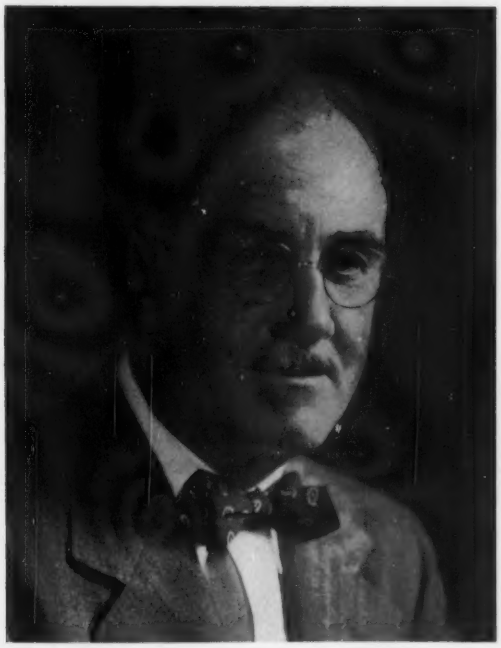
Another cause of difficulty is the highest percentage of employed persons in history, and unemployment is no problem for the person who wishes a job. Industry is naturally competing with the armed forces with its higher pay and more prerequisites, especially in health insurance. This year, the government has provided the Medicare program, through which the actual dependents of service men will get care under regulations and considerations, but very liberal ones.

The act went into effect on December 7. Congress provided the machinery and appointed an army task force to make negotiations. Not too much time was available after the adjournment of Congress up to December 7. The American Medical Association, being the representative of the medical profession, appointed a task force to accomplish an almost impossible task in the time limit. Their attorneys and designated officials, after innumerable conferences, arrived at a procedure. A controlling contract form was negotiated, through which the individual state medical societies would contract with the military departments to render care for the dependents of the armed forces personnel.

This contract form wisely provided that each state medical society negotiate fees on its own basis and agree to administer the program itself, or designate some organization as representative and intermediary. Late in October, the state medical societies were invited to Washington to sign their contracts. On that trip, the terms of the contract were first learned. Many of the states had designated Blue Shield as their representative; others were to administer their own program.

The contract provides that, regardless of the arrangements, each doctor who serves these dependents is actually in a personal contract, not with the patient but with the United States government. The service must be rendered for the agreed amount, and under no circumstances is a separate or additional bill to be rendered. The states negotiated their fees, as provided. No one knows the extent and amount of medical and hospital, or even nursing care which will be involved in this new adventure in medicare, so the contracts are all on the cost-plus-operation expense basis. The present veteran's home-town care program is on a somewhat similar basis, the General Accounting Office reserving and using the right of visiting our offices and rechecking the expense claims. The government did not raise much objection, its rule being to accept mostly fee schedules as presented, because under the

(Continued on Page 130)



HOWARD B. SPRAGUE, M.D.

Heart Association Program

Featured speaker at the Annual Dinner Meeting of the Michigan Heart Association in the Grand Ballroom of the Sheraton-Cadillac Hotel, Detroit, at 6:30 P.M., Thursday, March 14, 1957, and Moderator of a Panel on "The Heart Patient at Work" during the Thursday morning program of the Michigan Clinical Institute (see below).

SCIENTIFIC SESSIONS ON HEART DISEASES

at the

MICHIGAN CLINICAL INSTITUTE

(Speakers provided by the Michigan Heart Association)

8:30-9:00 A.M.
"Rheumatic Fever"
DONALD E. CASSELS, M.D., Chicago, Illinois
Professor, Department of Pediatrics, University of Chicago

9:00-10:30 A.M.
Panel Discussion on "The Heart Patient at Work"
Moderator:
HOWARD B. SPRAGUE, M.D.
Lecturer on Medicine, Harvard Medical School

Panel Members:
E. A. IRVIN, M.D.
President, Michigan Heart Association
Medical Director, Ford Motor Company

M. S. CHAMBERS, M.D.
President-Elect,
Michigan Heart Association

MARION JOCZ, M.D.
Medical Director,
Chrysler Corporation

GORDON B. MYERS, M.D.
Professor of Medicine
College of Medicine
Wayne State University

JOHN G. BIELAWSKI, M.D.
Medical Director,
Michigan Heart Association

Michigan Clinical Institute

Closed Circuit Color Television Program

ELMER B. MILLER, M.D.

NICHOLAS GIMBEL, M.D.

WILLIAM S. CARPENTER, M.D.

M. S. DEWEESE, M.D.

CHARLES G. JOHNSTON, M.D.

RUSSELL L. MUSTARD, M.D.

J. W. LOGIE, M.D.

Wednesday
March 13, 1957

11:15 A.M. to 12:45 P.M.

COLOR TELEVISION PROGRAM, beamed to the Grand Ballroom, Sheraton-Cadillac Hotel through the co-operation of the staff of The Grace Hospital, Detroit and Smith, Kline and French Laboratories of Philadelphia.

OPERATIVE CLINICS

A. Operating Rooms of Grace Hospital

Under supervision of ELMER B. MILLER, M.D., Detroit, Associate Attending Surgeon at Grace Hospital and Instructor in Surgery, Wayne State University

1. **"Cholecystectomy and Bile Duct Exploration"**
   NICHOLAS GIMBEL, M.D., Detroit
   Associate Professor of Surgery, Wayne State University, College of Medicine

2. **"Gastric Resection"**
   WILLIAM S. CARPENTER, M.D., Detroit
   Harper and Mt. Carmel Hospitals and Instructor in Surgery at Wayne State University

B. Grand Ballroom, Sheraton-Cadillac Hotel

1. **Surgical Commentator and Moderator**
   MARION S. DEWEESE, M.D., Ann Arbor
   Associate Professor of Surgery, University of Michigan; Chief of Surgical Services, Ann Arbor Veterans Administration Hospital

2. **Panel of Discussants**
   CHARLES G. JOHNSTON, M.D., Detroit
   Professor of Surgery, Wayne State University College of Medicine

   RUSSELL L. MUSTARD, M.D., Battle Creek
   Past Chief of Surgery, Leila Post Montgomery Hospital; Consultant to Percy Jones Hospital and Lecturer in Surgery, University of Michigan

   JAMES W. LOGIE, M.D., Grand Rapids
   Consultant to St. Mary's and Blodgett Hospitals; Counselor, Michigan Chapter, American College of Surgeons

Thursday

March 14, 1957

11:15 A.M. to 12:45 P.M.

11:15 "Management of Hypertension"

FLOYD B. LEVAGOOD, M.D., Detroit
Associate Attending Physician, Grace Hospital; Instructor in Medicine, Wayne State University

F. B. LEVAGOOD, M.D.

11:45 Clinic on "Endocrine Diseases"

WILLIAM O. MADDOCK, M.D., Detroit
Associate Professor of Medicine, Wayne State University College of Medicine

ROBERT LEACH, M.D., Detroit
Assistant Professor of Medicine, Wayne State University College of Medicine

WILLIAM O. MADDOCK, M.D.

ROBERT LEACH, M.D.

12:15 Clinic on "Collagen Diseases"

ALFRED JAY BOLLET, M.D., Detroit
Assistant Professor of Medicine, Wayne State University College of Medicine

G. S. FISHER, M.D.

Friday

March 15, 1957

11:15 A.M. to 12:45 P.M.

11:15 "Uterine Bleeding"

GEORGE S. FISHER, M.D., Detroit
E. S. HOFFMAN, M.D., Detroit

E. S. HOFFMAN, M.D.

JAMES B. BLODGETT, M.D.

11:45 "Diagnosis and Management of Acute Arterial Obstruction"

JAMES B. BLODGETT, M.D., Detroit
Associate Attending Surgeon, Grace Hospital

12:15 "Examination of the Patient with Acute Abdominal Pain"

GORDON B. MYERS, M.D., Detroit
Professor of Medicine, Wayne State University College of Medicine

GORDON B. MYERS, M.D.

Michigan's Department of Health

Albert E. Heustis, M.D., Commissioner

MAJOR ISSUES IN PUBLIC HEALTH

Among the major issues in public health in Michigan today that will be reflected in budget requests made to the Legislature by the Michigan Department of Health are polio immunization, prevention of relapse in mental illness and air pollution control.

Polio Immunization

Michigan youngsters one through fourteen are now a well-immunized group. This year, immunization is being provided for children reaching one year and booster doses for all in the one through fourteen age range. But next year there will be approximately 200,000 more children reaching one year and unless vaccinations continue to be given widely, the immunized group will be diluted by 200,000 unvaccinated children each year.

There are three possible approaches in considering polio immunization:

1. A strong, positive program of all-out public participation might be developed to increase most rapidly the number of people protected from paralytic polio.

2. The entire responsibility for immunization might be placed on individuals and their own physicians. This would make polio the only communicable disease handled in this way. By Michigan law, the State Health Commissioner and local health officers are responsible for assuring that protection is offered for all children of the state against smallpox, diphtheria, whooping cough, tetanus and, in certain situations, typhoid fever. Polio vaccine was, of course, not available when these acts were written, but there is very specific emphasis on the state's interest in the wise use of the then known vaccines for the protection of all children.

3. The program might be planned in terms of the legally defined responsibilities of the State Health Commissioner in matters involving a communicable disease. Under such a program, opportunity for polimyelitis vaccination would be provided for the youngsters born each year, and for those children under 15 who move into Michigan, developing over the years, a population protected from paralytic polio.

Prevention of Relapse in Mental Illness

Over the years, local health department personnel, particularly nurses, have aided families in meeting problems in emotional and mental health as well as in physical health. A number of basic health department programs, such as child health conferences, have definite preventive mental health implications.

An expansion in this field is recommended on a trial basis to determine whether home visits and family consultation by the public health nurse can help to cut down the high rate of relapse in patients released from the mental hospitals.

In fiscal 1955, a total of 4,305 patients were released from Michigan mental hospitals on a convalescent placement basis. Of these, 1,457 later had to re-enter the hospital for further treatment.

In the recommended trial program which would be carried on in co-operation with the Michigan Department of Mental Health, six local health departments would be provided with an additional public health nurse. The nurse would be given certain basic training and would work not only under supervision of the local health officer but also under standing orders of the mental hospital medical staff. Each nurse would, in turn, provide training for other public health nurses on the local health department staff in working with mentally ill patients and their families.

Air Pollution Control

As a part of its occupational health program, the Michigan Department of Health has worked with industries to protect their employes from contaminated air within the factories. Today, the state is faced with a different and growing aspect of the same problem, community air pollution resulting from industrial dusts and fumes.

Industrial expansion, relocation of industries and adoption of new processing techniques, together with the public's insistent demand for cleaner air all point to the need for a well planned and carefully executed air pollution control program. Since several counties, or cities and counties, may have an air pollution problem stemming from a single industrial source, state regulations are needed to supplement local ordinances in bringing about effective control.

It is recommended that legislative action be taken to officially place community air pollution control under jurisdiction of the Michigan Department of Health.

Health Officer Positions Open

A number of desirable openings in Michigan for directors of local health departments are on file with the Section of Local Health Services of the State Health Department. Physicians interested are invited to write to the Section for information.

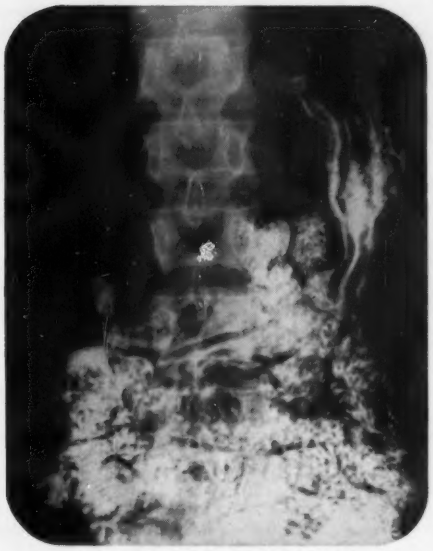
Externship Program for 1957

During the summer vacation period of 1957 the Michigan Department of Health will again sponsor an externship training program that will give to six selected sophomore or junior medical students ten weeks of work experience in local health departments.

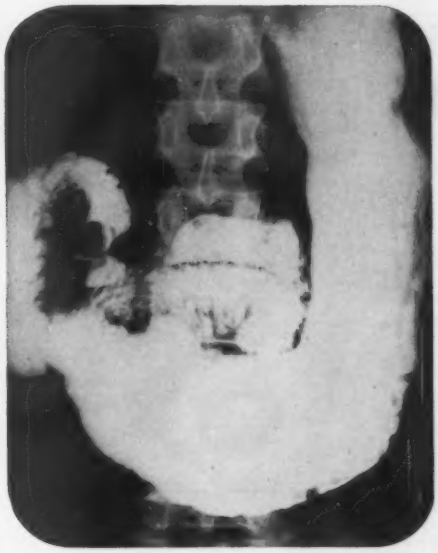
The objectives of the program are to provide interested students with an opportunity to observe and participate in an official public health program and, at the same time, to furnish personnel for carrying out useful projects. Health departments have already been invited to submit to the State Health Department projects suitable for the ten-weeks program. The local agency is responsible for travel expenses of the externs and the State Health Department pays salaries. Selection of students is made in co-operation with the deans of Michigan's medical schools.

DIAGNOSTIC AID

Reduced Hypermotility with Pro-Banthine® Improves Visualization



*Posterior-anterior film: definite hyperperistalsis with poor duodenal visualization.**



Posterior-anterior film after 15 mg. of Pro-Banthine intramuscularly: chronic duodenal ulceration clearly disclosed.

The same anticholinergic action which has made Pro-Banthine (brand of propantheline bromide) the outstanding therapeutic agent in peptic ulcer has also proved valuable in diagnosis.

By controlling the hypermotility, Pro-Banthine may permit delineation of a lesion otherwise not clearly visualized.

The technic is simple: If the first set of films shows hypermotility but no filling defect is demonstrable, reexamination is done a few minutes after intramuscular injection of 15 mg. or a half hour after oral administration of 30 mg. of Pro-Banthine.

This procedure has the additional advantage of demonstrating the patient's response to a given dosage of the drug.

G. D. Searle & Co., Chicago 80, Illinois, Research in the Service of Medicine.

*Roentgenograms courtesy of I. Richard Schwartz, M.D., Kings County Gastrointestinal Clinic, Brooklyn, N.Y.

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In Memoriam

Paul W. Butterfield, M.D., died Friday, October 12, 1956, at the age of forty-seven. He was stricken with a cerebral hemorrhage in Chicago where he had gone to attend annual meetings of the College of American Pathologists, of which he was a fellow, and the American Society of Clinical Pathologists.

Born April 23, 1909, Dr. Butterfield attended Bowdoin College at Brunswick, Maine, and Boston University Medical School. He interned in 1934-35 at Salem Hospital (Massachusetts) and was a resident pathologist in 1935-36 at Huntington Memorial Hospital in Boston and at Massachusetts Memorial Hospital.

He went to Alpena with his family to take the post of Alpena Hospital pathologist in 1953.

Dr. Butterfield was a member of the Tri-County Medical Society, Alpha Kappa Kappa medical fraternity, the Michigan State Medical Society, the College of American Pathologists, the American Society of Clinical Pathologists, the AMA, the Michigan State Pathological Society, and the Michigan State Blood Bank. He was a Rotarian and a member of Hopper Lodge No. 386, F and AM.

Surviving are Mrs. Butterfield and two sons, Paul, nine and Stuart, seven.

William A. Evans, Jr., M.D., Chief of Staff of Children's Hospital of Michigan and chief radiologist there for years, died at his home in Detroit, October 17, 1956, at the age of forty-nine.

Dr. Evans was widely known for his scientific work through the numerous articles he wrote covering various phases of roentgenology.

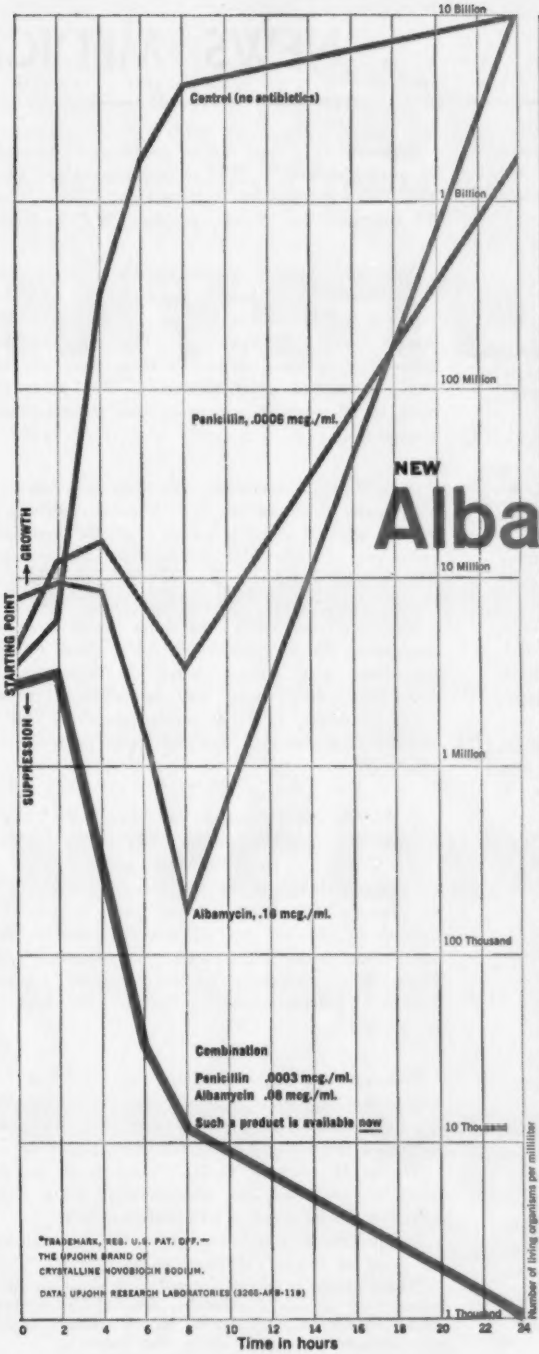
Dr. Evans was an active member of the Wayne County Medical Society from 1937 until his death. He was a Fellow of the American College of Radiology and American Roentgen Ray Society and a member of Nu Sigma Nu medical fraternity.

Born in Bellaire, Michigan, January 14, 1907, Dr. Evans resided in Detroit for forty-five years and practiced his specialty there for more than twenty years. Following graduation from Williams College in 1926, he studied medicine at Johns Hopkins Medical School, from which institution he obtained his M.D. degree in 1930.

Following his internship at Peter Bent Brigham Hospital, Boston, Dr. Evans did postgraduate work at the University of Wurzburg. He returned to Boston to serve two years as assistant instructor in medicine at Harvard University Medical School. He then came to Detroit to enter private practice as a roentgenologist.

His wife, Charlotte, a daughter, Elizabeth, and his mother, Mrs. William A. Evans, Sr., survive.

Say you saw it in the Journal of the Michigan State Medical Society



average dosage only t.i.d.

antibiotic synergism

The three gray lines of this graph show the growth rate of a penicillin-sensitive strain of Staphylococcus (Micrococcus pyogenes, var. aureus) under 3 conditions:

1. In the absence of antibiotics
2. In the presence of subinhibitory concentration of penicillin
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Even **half** these subinhibitory concentrations of penicillin and Albamycin, **when combined,** (black line) produce a dramatic **bactericidal** effect.

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(Albamycin plus penicillin)

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Risk of resistance: Because in vitro tests show this combination is synergistic against even Staphylococci **already** resistant to all other antibiotics, the risk of resistance is minimized.

Risk of enterocolitis: Because it has little or no effect on the predominant Gram-negative intestinal bacteria, and is highly effective against Staphylococci, there is virtually no danger of enterocolitis due to alteration in intestinal flora, or of other side effects such as perianal pruritus.

Convenience: Alba-Penicillin is oral therapy, and the average adult dosage is only **1 to 2 capsules t.i.d.,** which eliminates middle-of-the-night medication.

It is available in bottles of 16 capsules. Each capsule contains 250 mg. Albamycin (as novobiocin sodium, crystalline) and 250,000 units penicillin G potassium.

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Lewis Cohen, M.D., Detroit, is the author of "Electrovasography—For the Rehabilitation of Patients with Peripheral Arterial Disease," published in the *Bulletin of Sinai Hospital,* Detroit, June, 1956.

* * *

Plinn F. Morse Honored.—In recognition of more than forty years of devoted service to Harper Hospital, his stimulating leadership and wise counsel, the editors of *Harper Hospital Bulletin* have published a special number for September and October, honoring Plinn F. Morse, M.D.

The papers in this collection "represent the esteem of some of his many friends and associates and were born from studies inspired by a teacher . . . who gave his heart 'to seek and search out by wisdom concerning all things that are done under heaven.' "

There are some thirty papers in this special number. Contributors include: James Milton Robb, M.D., Lawrence Reynolds, M.D., Carl V. Weller, M.D., W. L. Brosius, M.D., L. W. Gardner, M.D., Viola G. Brekke, M.D., E. M. Knights, M.D., M. Hutchins, Sc.B., C.R.F. di Profio, M.D., G. T. Bradley, M.D., J. E. Croushore, M.D., W. H. Gordon, M.D., L. E. Holly II, M.D., D. J. Sandweiss, M.D., H. I. Kallet, M.D., B. R. Lutes, M.D., T. Leucutia, M.D., B. C. Lockwood, M.D., H. C. Mack, M.D., F. C. Schreiber, M.D., A. Nielsen, M.D., P. J. Huber, M.D., W. D. Mayer, M.D., M. R. Beitman, M.D., Richard M. McKean, M.D., S. G. Meyers, M.D., Rachel B. Keith, M.D., R. C. Moehlig, M.D., E. A. Osius, M.D., G. C. Penberthy, M.D., C. D. Benson, M.D., C. R. Reiners, M.D., A. Hazen Price, M.D., W. S. Reveno, M.D., H. Rosenbaum, M.D., H. C. Saltzstein, M.D., L. F. Segar, M.D., George Sewell, M.D., R. S. Siddall, M.D., L. D. Stern, M.D., and G. C. Thosteson, M.D.

* * *

The Seventh International Cancer Congress will meet in London, England, in July, 1958. It is sponsored by the International Union Against Cancer. The Congress will be held under the presidency of Sir Stanford Cade, and the headquarters will be the Royal Festival Hall.

There will be two main sessions of the Congress: Experimental and Clinical and Cancer Control. Special emphasis will be placed on Hormones and Cancer, Chemotherapy, Carcinogenesis and Cancer of the Lung.

Proffered papers will be considered only if submitted with an accompanying abstract (not over 200 words) before October, 1957, and must deal with new and unpublished work.

Registration forms and a preliminary program will be available early in 1957 on application to The Secretary General, Seventh International Cancer Congress, 45 Lincoln's Inn Fields, London, W.C.2, England.

* * *

Schering Award Winners.—Two senior medical students and one sophomore have won top places—and a total of $1,500 in cash prizes—in the 1956 Schering Award Contest. A panel of judges who are medical authorities in their respective fields have selected the students as first prize winners in this year's contest, open to all medical students in the United States and Canada.

* * *

Plan Now for Istanbul.—It's none too soon to make your plans to attend the 11th General Assembly of the World Medical Association—one of the most tangible privileges of your U.S. Committee membership. The forthcoming Assembly will be held in the world's "oldest and newest" city, Istanbul, Turkey, where Europe and Asia meet. The dates for the meeting are September 29 to October 5, 1957. Full information regarding travel arrangements, hotel reservations, and projected special tours, may be obtained by writing Louis H. Bauer, M.D., Secretary-Treasurer, The World Medical Association, 10 Columbus Circle, New York 19, N. Y.

* * *

A $1,000 contribution to aid Hungarian refugees in Austria was cabled November 18, 1956, by the International College of Surgeons following the receipt of an appealing letter from its Austrian chapter, with offices in Vienna. The letter referred to a "state of turmoil difficult to describe" and a "situation heart-rending beyond description." The letter was from M. Arthur Kline, M.D., physician to the American Embassy in Vienna and Secretary of the American Medical Society in Vienna.

* * *

Research in Blood.—An important award of $17,000 has been given to a Wayne State University Medical School professor by the Commonwealth Fund of New York for his work in blood clotting diseases.

Walter H. Seegers, Ph.D., chairman of the department of physiology and pharmacology since 1948, received a special creative scholarship award.

Significance of this honor was noted by Dean Gordon H. Scott of Wayne's College of Medicine:

"This award is newly created and designed by Commonwealth to allow scientists freedom from teaching and administrative duties to spend at least a year for uninterrupted research, study and lecturing.

(Continued on Page 104)

when you want broad spectrum antibiotic therapy with added safety for the many common respiratory, gastro-intestinal and urinary tract infections . . . the product to prescribe is

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the ONLY broad spectrum antibiotic preparation with added protection against monilial superinfection

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DOSAGE: 1 to 3 tablets daily as required.

SUPPLIED: As orange tablets, in bottles of 100 and 1000. Also available—

CUMERTILIN Sodium Injection, 1- and 2-cc. ampuls, in boxes of 12, 25, and 100; and 10-cc. vials, individually and in boxes of 10 and 100.

1. Pollock, B. E., and Pruitt, F. W.: Am. J. M. Sc., 226:172, 1953.

THE G. A. INGRAM COMPANY
4444 Woodward Avenue, Detroit 1, Mich.

(Continued from Page 102)

"To be picked one of the first recipients from a nationwide group of recognized scientists is a high honor for Dr. Seegers and Wayne's College of Medicine."

Dr. Seegers has spent twenty years tracing the mysteries of the clotting factors of blood. Late in the 1930's Dr. Seegers and his associates purified thrombin, a blood derivative—important to clotting. This was the first time any blood-clotting substance had been available for scientists to study in purified form. Blood clots in a few seconds when mixed with this powerful clotting agent.

Recently, Dr. Seegers and his associates have discovered derivatives of prothrombin. His blood research laboratory—one of the best equipped in the world—is in the process of describing the properties of these derivatives and obtaining purified products from platelets.

* * *

American Board of Obstetrics and Gynecology.—The next scheduled examinations (Part I), written, for all candidates will be held in various cities of the United States, Canada, and military centers outside the Continental United States, on Friday, February 1, 1957, at 2:00 P.M.

Candidates must submit case reports to the office of the Secretary within thirty days of being notified of their eligibility to Part I. Cases must be prepared in the manner described in the Bulletin of the Board and submitted with a duplicate index list.

Requests for re-examination in Part II must be received prior to February 1, 1957.

Current Bulletins outlining present requirements may be obtained by writing to: Robert L. Faulkner, M.D., Secretary, 2105 Adelbert Road, Cleveland 6, Ohio.

* * *

The Bankers Life and Casualty Company, owners of White Cross, have lost a suit of four years' standing, in which they attempted to enjoin certain groups from selling White Cross policies in Florida and Georgia. The judge claimed they had not shown a conspiracy. Bankers Life was assessed all costs.

* * *

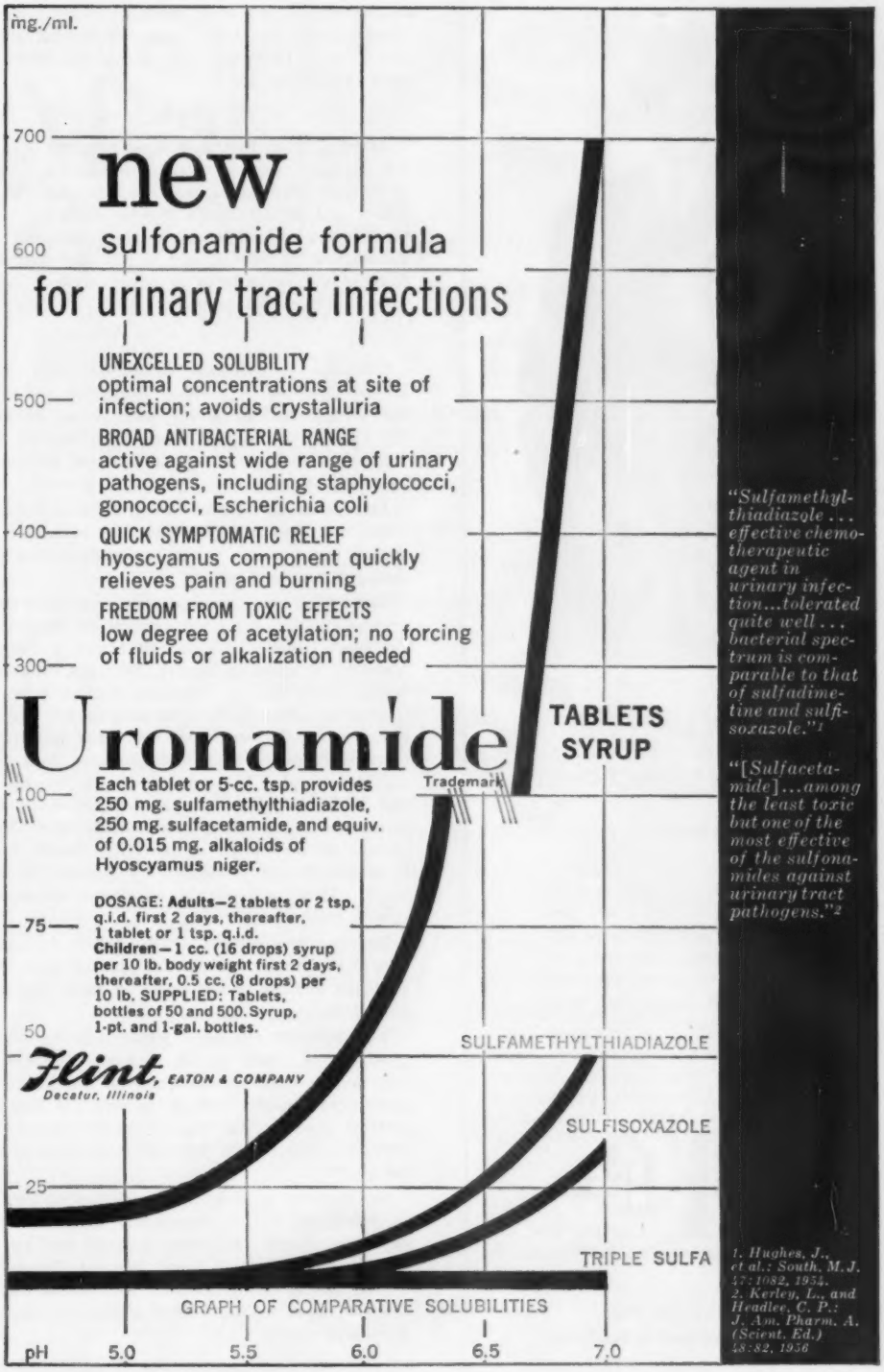
American Academy of General Practice.—It is estimated that more than 5,000 members will attend the next session of the American Academy of General Practice in St. Louis, Missouri, March 25-28, 1957.

During the four-day scientific meeting, the doctors will hear outstanding speakers discuss important subjects including infertility, polio vaccination, and the "neglected" pediatric areas, the eyes, ears, and feet. They will visit sixty scientific and 260 technical exhibits.

The Academy's policy-making Congress of Delegates will convene at 2 p.m., Saturday, March 23. All sessions of the Congress and many social functions will be held in the Sheraton-Jefferson hotel.

Wednesday evening, March 27, following induction ceremonies for Academy President-elect Malcolm E. Phelps, El Reno, Oklahoma, more than 3,000 guests will attend a President's reception and dance honoring J. S. DeTar, M.D., Milan, Michigan, president of the Academy.

(Continued on Page 106)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600
500
400
300
100
75
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new
sulfonamide formula
for urinary tract infections
UNEXCELLED SOLUBILITY
optimal concentrations at site of infection; avoids crystalluria
BROAD ANTIBACTERIAL RANGE
active against wide range of urinary pathogens, including staphylococci, gonococci, Escherichia coli
QUICK SYMPTOMATIC RELIEF
hyoscyamus component quickly relieves pain and burning
FREEDOM FROM TOXIC EFFECTS
low degree of acetylation; no forcing of fluids or alkalization needed
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Each tablet or 5-cc. tsp. provides 250 mg. sulfamethylthiadiazole, 250 mg. sulfacetamide, and equiv. of 0.015 mg. alkaloids of Hyoscyamus niger.
DOSAGE: Adults—2 tablets or 2 tsp. q.i.d. first 2 days, thereafter, 1 tablet or 1 tsp. q.i.d. Children—1 cc. (16 drops) syrup per 10 lb. body weight first 2 days, thereafter, 0.5 cc. (8 drops) per 10 lb. SUPPLIED: Tablets, bottles of 50 and 500. Syrup, 1-pt. and 1-gal. bottles.
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"[Sulfacetamide]...among the least toxic but one of the most effective of the sulfonamides against urinary tract pathogens."2
1. Hughes, J., et al.: South. M.J. 47:1082, 1954.
2. Kerley, L., and Headlee, C. P.: J. Am. Pharm. A. (Scient. Ed.) 45:82, 1956

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(Continued from Page 104)

Clifford W. Brainard, M.D., orthopedic surgeon of Battle Creek, has been appointed Special Advisor to the Crippled Children's Commission. His duties will extend throughout the state.

* * *

Martha Elliott Retires.—Those members who remember the many years of medical domination, or attempts at it, from Washington, will also remember Dr. Martha Elliott and the Children's Bureau which for years told the doctors what they could and could not do. Dr. Elliott, now of retiring age, will become Professor and head of the Department of Maternal and Child Welfare at Harvard University.

* * *

Congress on Medical Education.—The fifty-third annual Congress on Medical Education and Licensure will be held in Chicago's Palmer House, February 10-12, 1957. As in other years, the February program will center around an important current problem: graduate medical education for general practice.

Last year's co-sponsored program with the Advisory Board for Medical Specialties met with such success that it was decided to conduct another such program during the 1957 Congress.

Because of the general concern over preparation for general practice, the AMA Council on Medical Education and Hospitals decided to center a half-day co-sponsored program on Sunday, February 10, around discussion of the subject, "Graduate Medical Education for General Practice—1957." This program will be conducted as a symposium, covering the concept of what can be accomplished during the undergraduate four years of medical school. In addition, papers on the subject will be read, followed by a series of short, clear-cut statements by a group of representatives from the various specialty areas as to "What Should Constitute Graduate Medical Education for General Practice Today." There will also be a question-and-answer discussion period.

Sunday afternoon will be devoted to business meetings of the Advisory Board for Medical Specialties and the open meeting of Federation of State Boards of the United States.

The Monday afternoon session will be devoted to problems of postgraduate medical education. This will include keynote statements on the importance of postgraduate medical education and the challenges it presents, together with reasons for the council's current interest. This will be followed by a series of interesting papers.

On Monday evening, the Federation of State Medical Boards will hold its annual banquet, and on Tuesday, February 12, the conference program will be devoted to the Federation of State Medical Boards of the United States. Its program is centered on the theme: "Re-evaluation of the Licensing Examination."—*AMA Secretary's Letter.*

(Continued on Page 108)

Meat...

and the Need for Reasonable Amounts of Fat to Maintain Good Health

The place of dietary fat in human nutrition is being widely discussed. Scientists who know tell us that some fat is desirable in our everyday diet whether body weight has to be reduced or not.

Why are fats important to good health? Because they contribute to the processes of growth and replacement of tissue. Because they are an important source of calories. Because they make foods more inviting and better tasting.

Despite great advances in nutritional knowledge the exact role of fat in the diet is not yet fully defined. Yet it is known that some fat is necessary in healthful day-to-day nutrition.

For good health, good nutrition, and tastier meals, be sure there is some fat—in reasonable amounts—in your daily diet. Meat—the most versatile of high protein and B vitamin foods—because of its many varieties and cuts is an excellent vehicle to provide this essential fat in any amount desired. Animal fat products, such as lard, are not only economical, but add delightfully to the taste appeal of hundreds of recipes.

The nutritional statements made in this advertisement have been reviewed by the Council on Foods and Nutrition of the American Medical Association and found consistent with current authoritative medical opinion.

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(Continued from Page 106)

Lloyd L. Kempe, M.D., associate professor of bacteriology, told a University of Michigan "Atom Day" gathering November 16, 1956, that the use of radiation does not involve uncertain steps into an "eerie, intangible, mysterious unknown world" as many people believe. Most of the ideas being worked on now in research are extensions of original ideas and theories published twenty to thirty years ago.

Dr. Kempe cited as an example of much practical experience in the use of radiation, and the exposure of individuals to it, the use and development of the x-ray. "X-radiation is very similar to gamma radiation which we are getting out of fission. This type of radiation has been dealt with for many years. It is nothing new," said Dr. Kempe.

He stated also that although much progress has been made in developing irradiation of foods and other substances for preservation, researchers are being painstakingly cautious to answer every possible question and overcome every potential danger before letting such processes get to the public. Food processed by radiation should not be offered to the public yet.

There is a basic difference between heat sterilization and sterilization by irradiation. The first method requires high temperatures to kill the putrefactive organisms, while other toxin-producing organisms are killed immediately at moderately hot temperatures.

* * *

Malaria Eradication Program in Mexico.—Approximately 3,000,000 houses in the malarious areas of Mexico will be sprayed starting January 1, 1957, in the largest undertaking of its kind ever attempted in this hemisphere. This enormous enterprise is aimed at wiping out the mosquitoes which transmit malaria, thus effecting the eradication of this disease in Mexico.

* * *

A sharp increase in the number of cattle infected with tuberculosis in recent years is attributed mainly to complacency according to the Department of Agriculture. The infection rate is currently about 0.8 per cent. Three years ago it was almost 0.4 per cent and for many years the rate was as low as 0.2 per cent. The same could happen with human TB if case finding is relaxed. Dr. Herbert R. Edwards, professor of public health and medicine at Yale University, in the 1956 Baker Lecture at the University of Michigan said, "It is not only complacency in the general public we must be concerned with, but the fact that a large number of professional workers, including some in the field of public health, are apparently not fully awake to the continued seriousness of the disease (tuberculosis)."

Michigan Tuberculosis Association

* * *

Mortality is not the real yardstick to measure the importance or judge the control of a disease. Even if there were drugs capable of preventing the sudden

(Continued on Page 110)

Trasentine®-Phenobarbital

integrated relief . . .
mild sedation
visceral spasmolysis
mucosal analgesia

TABLETS *(yellow, coated), each containing 50 mg. Trasentine® hydrochloride (adiphenine hydrochloride CIBA) and 20 mg. phenobarbital.*

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CIBA
Summit, N. J.

(Continued from Page 108)

deaths resulting from hypertension and arteriosclerosis, these conditions would remain a tremendous medical and social problem. Similarly, adults do not commonly die of mental disorders, arthritis, or peptic ulcers. Yet, no one would claim that these afflictions have been conquered. Neither has tuberculosis been conquered. Instead, the forces which have been at work during the past century have slowly converted it from a killing to a chronic disease.—RENE J. DUBOS, Ph.D., National Tuberculosis Association Transactions, May, 1954.

* * *

J. Earl McIntyre, M.D., of Lansing, was elected President of the Association of Surgeons of the Chesapeake and Ohio Railway System at the November annual meeting held at White Sulphur Springs, W. Va.

* * *

Paul H. Engle, M.D., of Olivet, has departed for Pakistan, India, under State Department appointment for two years at the American Embassy to serve the nationals of the area.

* * *

Courses in "Surgery in Acute Trauma" are being conducted by the American Army Medical Services at Army Hospitals in Washington, D. C., Denver, Colorado, San Francisco, California, Phoenixville, Pennsylvania, Fort Bliss, Texas, and Tacoma, Washington, April 1-3, 1957 and at Fort Sam Houston, Texas, May 6-8, 1957. For program and full information, write E. Roy Wells, Director of Technical Advisory Office, Federal Civil Defense Administration, Region 4, Battle Creek, Michigan.

* * *

The ACS Chicago Regional Committee on Trauma is sponsoring an intensive course on fractures and other trauma at the John B. Murphy Auditorium, 50 E. Erie Street, Chicago, April 10-13, 1957. For information and program, write John J. Fahey, M.D., 1791 W. Howard Street, Chicago, Illinois.

* * *

O. T. Mallery, Jr., M.D., has been appointed to the newly created position of Medical Director for Employers Mutuals of Wausau, Wisconsin. Dr. Mallery was a member of the University of Michigan faculty for ten years.

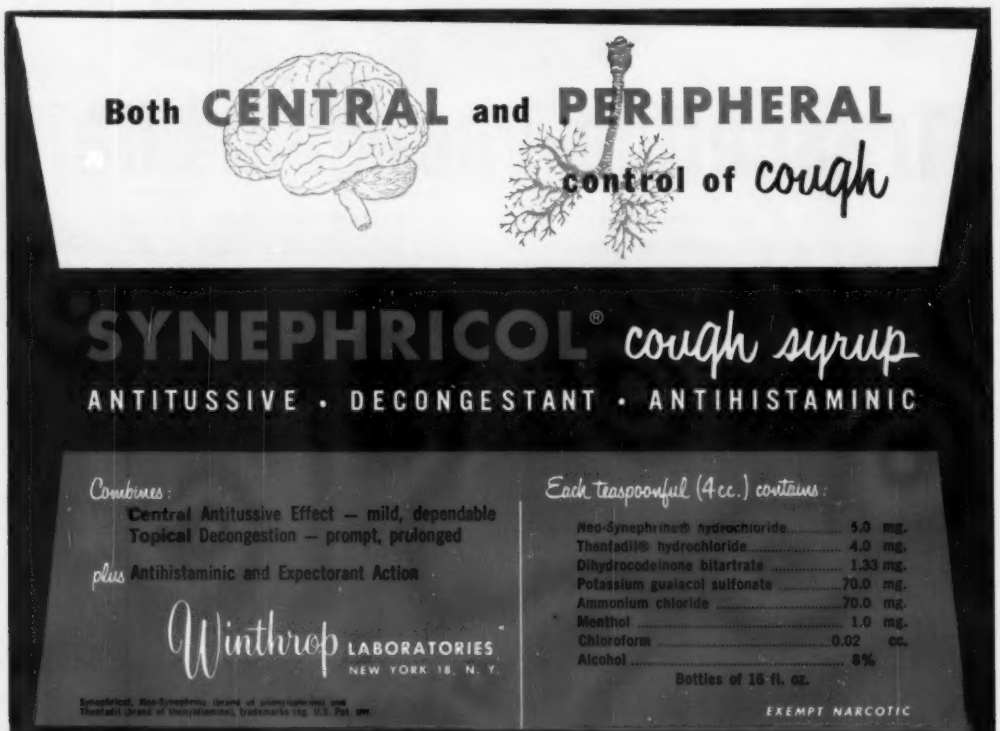
* * *

The Seventh International Cancer Congress will be held in London, July 6-12, 1958. Further information and travel details may be procured from the Secretary General, 45 Lincoln's Inn Fields, London, W.C. 2, England.

* * *

Cancer News is available to all doctors of medicine who are members of the Michigan State Medical Society, through the courtesy and generosity of the two Divisions in Michigan of the American Cancer Society (the Southeastern Michigan Division covering the

(Continued on Page 112)



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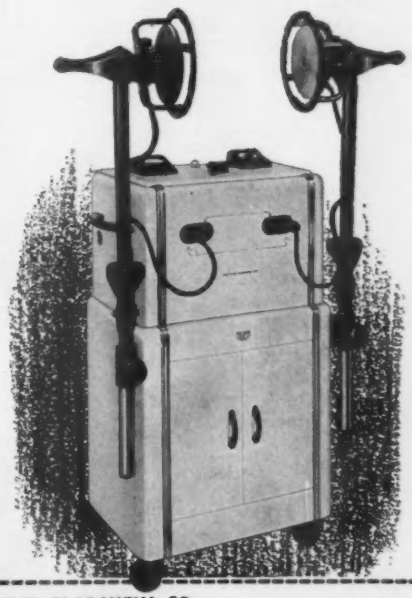

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CITY/STATE _____

(Continued from Page 110)

counties of Wayne, Oakland and Macomb, and the Michigan Division covering the balance of the state).

It is suggested this publication be placed in the waiting rooms of every doctor of medicine, as it contains excellent information for patients and others.

If you wish to be placed on the mailing list of either one of the ACS Divisions to receive *Cancer News* monthly, write to either one of the Divisions, in which area you are located—Michigan Division, Helmer Building, Grand Rapids, and Southeastern Michigan Division, 4811 John R. Street, Detroit, Michigan.

* * *

E. M. Vardon, M.D., Detroit, recently contributed a valuable Verifax (photographic copying) machine to the Michigan State Medical Society, for use in its Executive Offices at 606 Townsend, Lansing.

The Council expressed gratitude to Dr. Vardon by placing a vote of thanks to him on its minutes at the meeting of November 14.

* * *

Supplying necessary rehabilitative services emphasizes more than any other instance the combined role of the physician, hospital, and health department in meeting community needs.—L. E. BURNEY, M.D., California Medicine, January, 1956.

John P. Caffey, M.D., Professor of Radiology at Columbia University Medical School, New York, will deliver the annual Hickey Memorial Lecture at Wayne University College of Medicine Auditorium, 645 Mullett St., Detroit, on Thursday, March 14, 1957, at 8:30 p.m.

The Hickey Lecture is given under the auspices of the Detroit Roentgen Ray and Radium Society, the Wayne County Medical Society, and Wayne University College of Medicine.

Dr. Caffey's subject will be "The Skeleton in Cooley's Anemia."

This interesting lecture will be held coincident with the Michigan Clinical Institute at an hour when no MCI lectures or program are scheduled. All MSMS members are cordially invited to attend.

* * *

Next to knowing when to seize an opportunity, the most important thing in life is to know when to forego an advantage.

* * *

M.D. LOCATIONS—(Through December 1, 1956)

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Paul A. Dosch, M.D.	Grayling

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Date	*Station*	*Subject*	*Guests*
Nov. 4	WJBK-TV Detroit	The Story Behind Your Doctor's Prescription Food and Soil	Film Film
Nov. 8	WKAR-TV East Lansing	Orthodontics	Edward A. Cheney, D.D.S., Lansing Harlow Shehan, D.D.S., Jackson Christine Lancaster, St. Johns Christie Wiard, Lansing
Nov. 11	WJBK-TV Detroit	M.D. Placement (A Citizen Participates)	Film
Nov. 18	WJBK-TV Detroit	Multiple Sclerosis	Gabriel Steiner, M.D., Detroit A. H. Lindley, Detroit Abraham Brickner, Detroit
Nov. 25	WJBK-TV Detroit	A Life to Save	Film

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1. Science News Letter, March 1954
2. Greenblatt, R. B.: Obstet. & Gyn. 2:530, 1953

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1956-57 RADIO SERIES

Date	No.	Subject	Speaker
October			
10- 5-56	1	The Childless Couple	Samuel J. Behrman, M.D.
10-12-56	2	The Importance of Prenatal Care	Tommy N. Evans, M.D.
10-19-56	3	Preparing the Family for the New Baby	Ernest H. Watson, M.D.
10-26-56	4	What is the Meaning of Vomiting in the Baby?	Robert Heavenrich, M.D.
November			
11- 2-56	5	What is the Meaning of Diarrhea in the Baby?	William Stewart, Jr., M.D.
11- 9-56	6	Why does Your Baby Need "Shots"?	George Lowrey, M.D.
11-16-56	7	Muscular Dystrophy	Russell DeJong, M.D.
11-23-56	8	The Menopause	F. W. Tamblyn, M.D.
11-30-56	9	Health Investments for Advancing Years	Seward E. Miller, M.D.
December			
12- 7-56	10	Why You Need an Annual Health Examination	John R. Rodger, M.D.
12-14-56	11	Rheumatism	William Mikkelsen, M.D.
12-21-56	12	Advances in the Treatment of Arthritis	William Caster, M.D.
12-28-56	13	Backache	Charles H. Frantz, M.D.
January			
1- 4-57	14	Research and the March of Dimes	James L. Wilson, M.D.
1-11-57	15	What is being done for the Polio Patient Today?	David G. Dickinson, M.D.
1-18-57	16	Body Functions and the Endocrine Glands	Jerome W. Conn, M.D.
1-25-57	17	The Thyroid Gland	William Bierwaltes, M.D.
February			
2- 1-57	18	Trends in the Treatment of Diabetes	Steven Fajans, M.D.
2- 8-57	19	Coronary Heart Disease	Park Willis, M.D.
2-15-57	20	Rheumatic Heart Disease	Aaron Stern, M.D.
2-22-57	21	How to Live with Your Heart Disease	Franklin Johnston, M.D.
March			
3- 1-57	22	High Blood Pressure	Sibley W. Hoobler, M.D.
3- 8-57	23	What can You do for the Victim of an Automobile Accident?	C. Thomas Flotte, M.D.
3-15-57	24	What can You do for the Burned Victim?	Robert E. L. Berry, M.D.
3-22-57	25	What can You do for the Person Who Swallows Poison?	Craig Booher, M.D.
3-29-57	26	What can You do to Prevent Accidents in the Home?	Robert H. Trimby, M.D.
April			
4- 5-57	27	Early Warning Signs of Cancer of the Female Generative Organs	Tommy N. Evans, M.D.
4-12-57	28	Breast Cancer	Burgess Vial, M.D.
4-19-57	29	Cancer of the Blood	Frank Bethell, M.D.
4-26-57	30	Cancer Research	Howard Latourette, M.D.
May			
5- 3-57	31	What is Cerebral Palsy?	Martha Westerberg, M.D.
5-10-57	32	What is Being Done for the Cerebral Palsied?	Richard Allen, M.D.
5-17-57	33	The Problem of Sex Education	Stuart Finch, M.D.
5-24-57	34	The Emotional Aspects of Epilepsy	H. Waldo Bird, M.D.
5-31-57	35	What can be Done for the Hard of Hearing?	James H. Maxwell, M.D.
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6- 7-57	36	Recent Advances in the Treatment of Tuberculosis	W. N. Davey, M.D.
6-14-57	37	The Medical Aspects of Cough	Nancy Furstenberg, M.D.
6-21-57	38	Appendicitis	Marion DeWeese, M.D.
6-28-57	39	Hay Fever	Robert Lovell, M.D.
July			
7- 5-57	40	Summer Itch	Richard Harrell, M.D.

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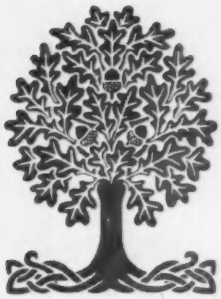

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Johnson McGuire, Professor of Clinical Medicine and Director of Cardiac Laboratory, University of Cincinnati College of Medicine, will serve as moderator for the Symposium

K. J. Franklin, The Medical College of St. Bartholomews Hospital, London.
INVESTIGATION OF WHAT IS CONSIDERED NORMAL FOR THE AGING CARDIOVASCULAR SYSTEM

J. Earle Estes, Jr., Mayo Clinic, Rochester, Minnesota.
VENOUS DISORDERS IN OLDER PEOPLE

Walter S. Priest, Associate Professor of Medicine, Northwestern University School of Medicine, Chicago.
ANTICIPATION AND MANAGEMENT OF CARDIAC DECOMPENSATION

Jessie Marmorston, Professor of Experimental Medicine, University of Southern California, Los Angeles.
HORMONAL ASPECTS OF MYOCARDIAL INFARCTION IN FEMALE AND MALE SUBJECTS

Ancel Keys, Professor of Physiology and Director of Laboratory of Physiological Hygiene, University of Minnesota, Minneapolis.
CALORIES AND CHOLESTEROL

Robert W. Wilkins, Professor of Medicine, Boston University School of Medicine, Boston.
DRUG THERAPY FOR HYPERTENSIVE VASCULAR DISEASE IN PATIENTS PAST MIDLIFE

Robert A. Bruce, Associate Professor of Medicine, University of Washington School of Medicine, Seattle.
EVALUATION OF FUNCTIONAL CAPACITY IN PATIENTS WITH CARDIOVASCULAR DISEASE

Edward J. Stieglitz, Consultant in Geriatrics, Veterans Administration and St. Elizabeths Hospital, Washington, D. C.
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Legal Opinions

Mr. William J. Burns
Executive Director
Michigan State Medical Society

Dear Mr. Burns:

In answer to inquiry as to the legality of consulting surgeons from out state who have no Michigan license but who are qualified men in their specialties:

I believe the answer is to be found in the statutes relating to the practice of medicine and surgery in Michigan. Section 7 of the Act (14.537 M.S.A.) makes it unlawful for any person to practice medicine or surgery in this state who is not the lawful possessor of a certificate of registration or license issued under and pursuant to the Michigan Registration Act. However, Section 8 of the Act (14.538 M.S.A.) provides in part as follows: "This Act shall not apply to the commissioned surgeons of the United States Army, Navy or Marine hospital service, in actual performance of their official duties, *nor to regularly licensed physicians and surgeons from out of this state, in actual consultation with physicians and surgeons of this state.*"

It is my opinion that the foregoing exception covers the situation outlined in the inquiry and that a regularly licensed physician and surgeon from out of the state and who is qualified may properly consult with physicians and surgeons in this state.

Very truly yours,
LESTER P. DODD, *Legal Counsel*

Dear Mr. Burns:

You recently referred to me for opinion an inquiry with respect to so-called "privileged communications."

Specifically, the doctor inquires as to the propriety

(1) of giving information with respect to injuries sustained by a patient to a newspaper for publication therein, and,

(2) of giving information pertaining to the diagnosis and prognosis to a Red Cross Worker for the purpose of informing or obtaining leave for a Serviceman relative.

These inquiries present interrelated questions of law and ethics. The Michigan Statutes deal with the general subject of privileged or confidential communications in two ways. Section 27.911 M.S.A. provides in part as follows:

"No person duly authorized to practice medicine or surgery shall be allowed to disclose any information which he may have acquired in attending any patient in his professional character, and which information was necessary to enable him to prescribe for such patient as a physician, or to do any act for him as a surgeon."

This Section is a part of the Judicature Act and pertains primarily to court procedures. It is essentially a rule of evidence and is involked only in relation to determining what a physician or surgeon may or may not be permitted to testify to on the witness stand. The privilege is that of the patient and not of the doctor and may be waived either expressly or impliedly by the patient. Moreover, the privilege applies only to such matters as are given to the physician in confidence and does not apply to many items of information gained by the physician from observation. This statute is not a penal one and, as observed above, is intended primarily to apply to a physician's disclosures while a witness in court.

(Continued on Page 120)

Annual Clinical Conference

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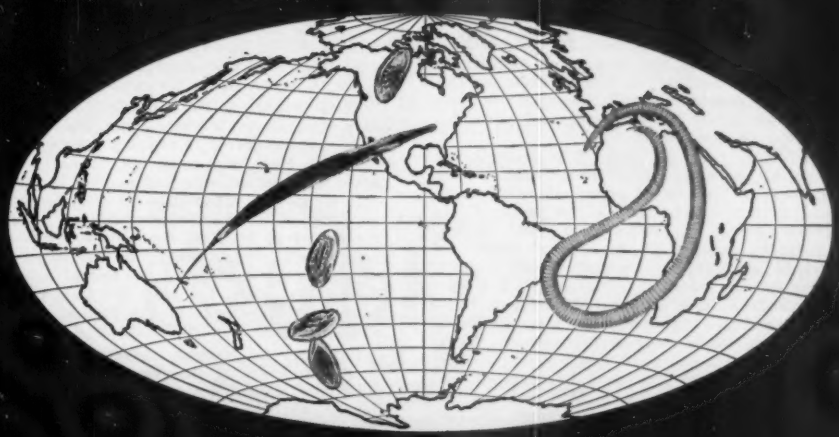

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(Continued from Page 118)

Another section of the Michigan Statutes (14.533 M.S.A.) makes it a ground for refusal of registration, revocation or suspension of registration, or conviction of a misdemeanor for a physician to "willfully betray a professional secret."

The Statute does not define what constitutes the willful betrayal of a professional secret and has never been before our courts for construction so that its interpretation is a matter of first impression. In my opinion, however, it relates solely to the keeping in confidence of such matters as are disclosed to the physician by the patient while in professional attendance upon the patient and which are given in confidence and with the intention that they be kept secret.

From a strict legal point of view, it is my opinion that neither of the questions posed would involve violation of the so-called "privileged communication" statute above quoted since court action is not involved.

As to whether giving out information under either set of circumstances outlined by the doctor would involve betrayal of a professional secret would depend wholly upon the specific information disclosed. If it did not include or depend upon information conveyed by the patient in confidence and with the intention that it be kept secret, it would not, in my opinion, be a violation.

I feel, however, that the questions here raised involve such inter-related questions of law and professional ethics as to warrant some discussion of the latter aspect of the matter. Assuming that in most cases it would not be unlawful to disclose information under either set of circumstances outlined by the doctor, the propriety of so doing, particularly the giving of information to newspapers, may be open to question.

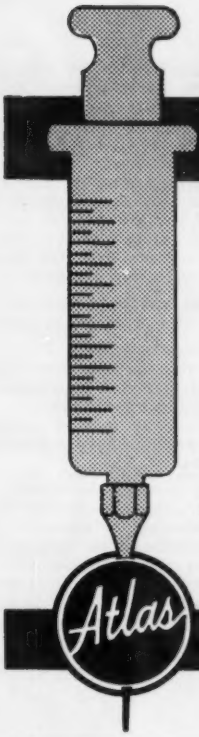
Section 5 of Chapter I of the Principles of Medical Ethics of the American Medical Association, having to do with the physician's relationship to the media of public information, states that "an ethical physician * * * may reveal information regarding a patient's physical condition *if the patient gives his permission.*" While not stated in the converse, this language rather strongly implies that it would not be regarded as ethical to disclose such information without the patient's permission. I am quite willing to assume that there may be circumstances where such permission may be implied but in the absence of either express or implied permission, I am of the opinion that a physician may not, with propriety, give information about his patient's injuries to a newspaper for publication.

With respect to the propriety of giving information to a Red Cross Worker under the circumstances outlined by the doctor, I reach a somewhat different conclusion. Here the physician cannot be charged with advertising or self-aggrandizement as he might in the case of giving information to a newspaper. Section 3 of Chapter II of the Principles of Medical Ethics of the American Medical Association provides: "the physician should neither exaggerate nor minimize the gravity of a patient's condition. He should assure himself that the patient, *his relatives or his responsible friends* have such knowledge of the patient's condition as will serve the best interests of the patient and the family."

I am of the opinion, therefore, that subject always to the necessity of making sure that he does not disclose information given to him by his patient in confidence, the physician may, in the exercise of his judgment of what is in the best interest of his patient, lawfully and with propriety, give information to a Red Cross Worker under the circumstances outlined in the doctor's second question.

Very truly yours,

LESTER P. DODD, *Legal Counsel*



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Correspondence

It has been brought to my attention that some of the persons with whom we have negotiated contracts under the Dependents' Medical Care Act are of the opinion that the Program is not one of full service coverage. This concept may have arisen because the Act itself is not specific regarding this matter. It may also have arisen either because certain fees are stipulated to be paid by the patient or because the contract allows for unusual or difficult case an additional fee payable by the Government to the physician if he makes proper request under a special report.

Upon inquiry, I have been assured that members of negotiating teams have not indicated the contract is other than for full coverage. Further, no instance has been found where any member of the negotiating teams has, in any way, intimated that the Dependents' Medical Care Program is not one of full coverage.

In order to clarify this matter and to avoid any improper interpretation of the Dependents' Medical Care Act with regard to payments to physicians under a Schedule of Allowances as provided in our contracts, the position of the Department of Defense as is being carried out by my office is submitted for your guidance:

(a) It is intended that civilian medical care authorized under Public Law 569, 84th Congress, will be on a basis comparable to that provided in uniformed services medical facilities. Except for specified amounts to be paid by the patient, the services which are provided under the law will be furnished by physicians participating in the program who will receive payment in full from the Government in accordance with the published Schedule of Allowances or under a special report as the case may be. In most instances, this means that the physician participating in the program will receive payment for his usual charge or the amount established in the local schedule of allowances, whichever is less.

(b) Section 5, paragraph 507b, of the Joint Directive promulgated by the Secretary of Defense and the Secretary of Health, Education, and Welfare provides as follows: "The Executive Agent (Secretary of the Army) shall be responsible within the continental United States, Alaska, Hawaii, and Puerto Rico for the following:

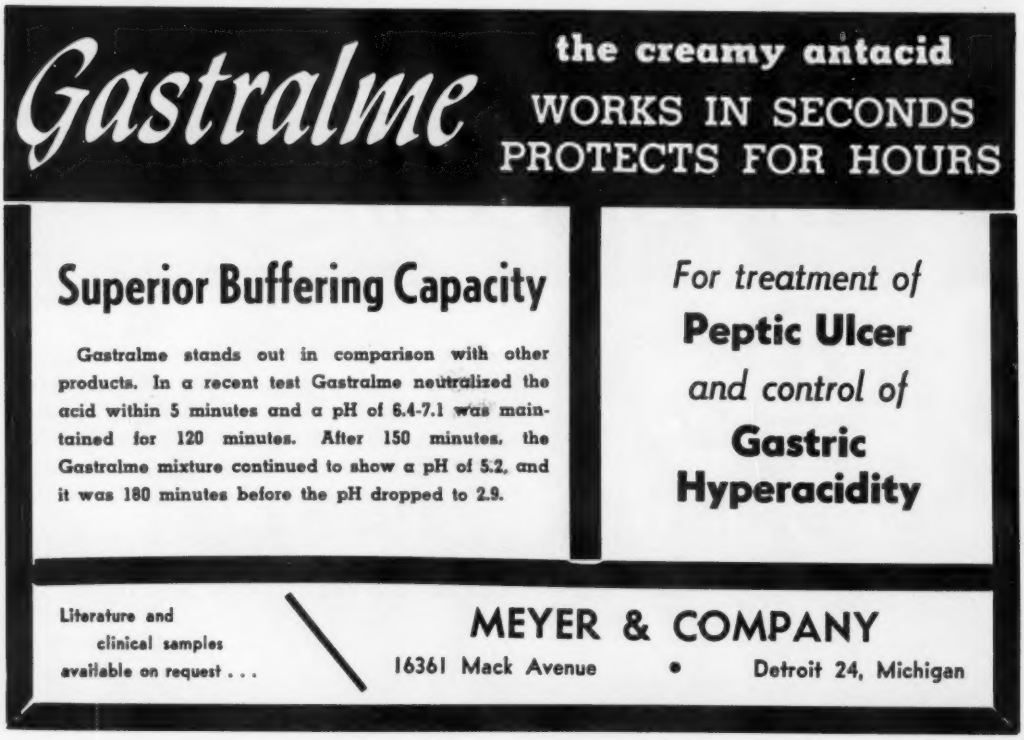
(1) Preparation of the terms and placement of the contract or contracts to be established to include but not limited to:

(a) Local schedules of allowances to be used *in full payment* of bills presented by physicians and surgeons." (Underscoring added.)

A copy of this Joint Directive is an integral part of every contract and there is no question that the contract provides for full service coverage.

(c) There may be unusual instances in which the physician will believe that an allowance greater than that prescribed in the local schedule of allowances is justified. In such cases, the physician should look to the Government for additional payment, and not to the patient. Provision is made for the physician to submit a special report to his state medical society and in turn to the Government as a request for additional payment. Such additional payment will be made upon approval by the medical society's review board and by the Government's contracting officer.

Your assistance in providing physicians in your state with this information will be helpful to all concerned. We believe that a clear understanding of this matter before the Dependent's Medical Care Program goes into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effect is essential and will help to prevent problems or criticisms which otherwise might result from a lack of understanding on the part of physicians participating in the program.

Your co-operation and assistance in implementing the Dependents' Medical Care Program is most gratifying and with your continued help I believe the program will be most successful.

Sincerely,

PAUL I. ROBINSON
Major General, M.C.
Executive Director
Office for Dependents' Medical Care

Department of the Army
Office of the Surgeon General
Washington, D. C.
19 November 1956

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No further attempts were recorded until the 1800's, when it was discovered that removal of the fibrin from the blood eliminated coagulation during transfusion.

Again, however, the record shows little advance until in 1907 when Dr. George W. Crile, Cleveland surgeon, performed a successful direct transfusion, suturing the blood donor's artery to the patient's vein in the wrist. At this time the brother of the patient was used, since it was felt his blood would be most suitable.

* * *

Money is such an elusive thing—not only to get and keep, but even to keep track of. New reports say that Americans owe more than ever before, some 700 billion dollars in public and private debt—up a whopping 294 billion since World War II ended. But along with this, the reports say also that Americans are richer than ever before—they own, in public and private wealth, some 1½ trillion dollars' worth of property, and this year their income will be 340 billion dollars. But still another report says that all this doesn't mean what it seems to mean; that rising taxes and inflation since 1939 have made $6,122 now equal actually to only $3,000 then. However you slice it, money, it seems, is still purely relative.—*B. C. Enquirer*, Oct. 24, 1956.

* * *

Postgraduate course in Diabetes and Basic Metabolic Problems will be held January 30, 31 and February 1, 1957, at Columbus, Ohio, University Health Center. For further information and registration forms, write: American Diabetes Association, 1 East 45th Street, New York 17.

* * *

The Frank E. Bunts Educational Institute of the Cleveland Clinic Foundation will present a course on "General Practice" February 6-7, 1957, "Otolaryngology" on February 27-28, 1957, and "Medical Progress and its Relationship to Deintistry" on March 13-14, 1957. For additional information and registration forms write: Registrar, 2020 East 93rd Street, Cleveland 6, Ohio.

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BOOKS RECEIVED

AIRCRAFT IN DISTRESS. A Study of the broad field of aircraft assistant and distress operations, flying safety, aircraft emergencies and evacuation, rescue aircraft interception procedures, aircraft emergency landing and ditching procedures, and first-aid and survival. Harry D. Kysor, Captain, Eastern Air Lines, Inc. New York; Aviation Consultant to the Aviation Bureau, Loss Prevention Department, Liberty Mutual Insurance Company, Boston, Massachusetts. Philadelphia: Chilton Company, Inc., 1956.

MYSTERIOUS WATERS TO GUARD. (Essays and Addresses on Anesthesia). By Wesley Bourne. Springfield, Illinois: Charles C Thomas, 1955. Price $8.50.

DISEASES OF THE LIVER. Edited by Leon Schiff, M.D., Ph.D., Professor of Clinical Medicine, University of Cincinnati, College of Medicine; Director, Gastric Laboratory, Cincinnati General Hospital. With A Foreward by Cecil J. Watson, M.D., Ph.D., Philadelphia and Montreal: J. B. Lippincott Company, 1956. Price $16.00.

BELLEVUE IS MY HOME. By Salvatore R. Cutolo, M.D., with Arthur and Barbara Gelb. Garden City, New York: Doubleday & Company, Inc., 1956. Price $4.00.

CLINICAL ELECTROCARDIOGRAPHY. Part I. The Arrhythmias With An Atlas Of Electrocardiograms By Louis N. Katz, A.B., M.A., M.D., F.A.C.P. Director, Cardiovascular Department, Michael Reese Hospital, Chicago, Illinois; Professional Lecturer in Physiology, University of Chicago, Chicago, Illinois. And Alfred Pick, M.D., Physician-In-Charge of Heart Station and Research Associate, Cardiovascular Department, Michael Reese Hospital, Chicago, Illinois. Illustrated With 415 Engravings. Philadelphia: Lea & Febiger, 1956. Price $17.50.

THE OFFICE ASSISTANT in Medical or Dental Practice. By Portia M. Frederick, Instructor, Medical Office Assisting, Long Beach City College, and Carol Towner, Executive Assistant, Department of Public Relations, American Medical Association. Philadelphia and London: W. B. Saunders Company, 1956.

DISTURBANCES OF BODY FLUIDS. Clinical Recognition and Management. By John H. Bland, M.D., Associate Professor of Medicine, University of Vermont College of Medicine. Second edition. Philadelphia and London: W. B. Saunders Company, 1956.

TEXTBOOK OF MEDICAL PHYSIOLOGY. By Arthur C. Guyton, M.D. Professor and Chairman of the Department of Physiology and Biophysics, University of Mississippi School of Medicine. Illustrated. Philadelphia and London: W. B. Saunders, 1956.

IN THE DOCTOR'S OFFICE. The Art of the Medical Assistant. By Esther Jane Parsons, formerly Research Technician, Department of Biochemistry, College of Physicians and Surgeons, Columbia University; formerly Instructor in Medical Office Procedures,

(Continued on Page 126)

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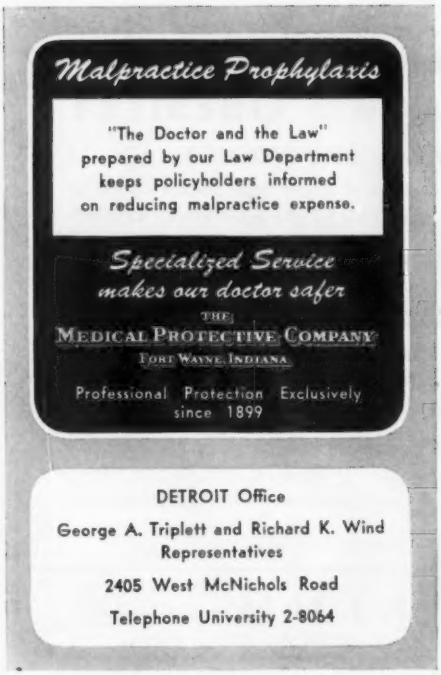

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(Continued from Page 124)

Paine Hall School for Medical Assistants, New York City. Illustrations by Jean McConnell. Second edition. Philadelphia and Montreal: J. B. Lippincott Company, 1956. Price $3.95.

THE NEUROSES IN CLINICAL PRACTICE. By Henry P. Laughlin, M.D., Assistant Clinical Professor of Psychiatry, George Washington University School of Medicine; Head, Psychiatry and Neurology Division, Suburban Hospital, Bethesda, Maryland; Consultant in Psychiatry, Walter Reed Army Medical Center. Philadelphia, London: W. B. Saunders Company, 1956. Price $12.50.

YOUR BLOOD PRESSURE and How to Live With It. By William A. Brams, M.D. Illustrations by Hertha Furth. Philadelphia and New York: J. B. Lippincott Company, 1956. Price $2.95.

DICTIONARY OF POISONS. By Ibert Mellan and Eleanor Mellan. New York: Philosophical Library. Price $4.75.

This book is printed in large type and easily read. Each poison is listed in alphabetical order and there is a full history or description of the poison, its uses and forms, the scientific and common names and the antidote to be given. Usually there is a list of three things to do, and on many in capital letters there is a warning CALL A PHYSICIAN. Sometimes the word IMMEDIATELY is added! We notice one item that is repeated many times, "give a universal antidote," but we are unable to find such a formula in the book. There is a recognized universal antidote consisting of charcoal, or burnt toast, strong tea or tanic acid, with magnesium sulfate in a mixture.

SLEEP. By Marie Carmichael Stopes, D.Sc., London; Ph.D., Munich; Fellow of the Royal Society of Literature. New York: Philosophical Library. Price $3.00.

Sleep is the primitive and profound pleasure of all mankind. It is enjoyed when past. Many people sleep badly and to some inducing sleep is an effort. The amount of sleep needed varies from one person to another but fairly constant for individuals. Short periods of daytime sleep often give proportionately more refreshment than the long sleep at night. "It is a crime of the first magnitude to wake anyone, save in an emergency."

Chapters are devoted to Beds and Bed Clothes, What Is Sleep, Sleep in Animals, Insomnia, Do's and Don'ts and Feeling versus Thought. It is readable.

TREATMENT OF HEART DISEASE. A Clinical Physiologic Approach. By Harry Gross, M.D., F.A.C.P., Attending Physician, the Montefiore Hospital; Assistant Clinical Professor of Medicine, Columbia University College of Physicians and Surgeons, and Abraham Jezer, M.D., Attending Physician, The Montefiore Hospital; Assistant Clinical Professor of Medicine, Columbia University College of Phyiscians and Surgeons. Philadelphia and London: W. B. Saunders Company, 1956.

In no other text on heart disease has the reviewer noted a more concise yet complete interpretation of clinical cardiology and therapeutics based upon the

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now voluminous theoretical and experimental work on the subject. The reader is not overwhelmed with a never-ending detail of experimental statistics; instead theoretical and experimental topics are well indexed for those in search of greater detail, while the average reader finds facts sufficient to draw logical conclusions. The authors have achieved their objective very well, "to reach the general physician who, imbued with the physiological point of view, may more readily understand the symptoms and clinical course of his patients."

The volume is divided into seven parts, the first of which consists of an excellent summary of cardiac physiology. Digitalis and Quinidine are discussed thoroughly in succeeding chapters, followed by an excellent chapter on the arrhythmias. Congestive heart failure is dealt with in the light of present knowledge of chemistry and physiology. In the chapter on The Diet and Heart Disease, the factors of nutrition in heart disease are described. Sample diets and menus, including numerous recipes, are listed in detail in the appendix, composing one of the practical features of the book. Part II is concerned with the discussion of Hypertension, Hypertensive Heart Disease and Arteriosclerotic Heart Disease. Part III presents diseases of the heart secondary to inflammation, including Rheumatic Fever, Subacute Bacterial Endocarditis, Luetic Heart Disease, Cor Pulmonale, Non-specific Myocarditis and Pericarditis. In light of the marked advances in the diagnosis and treatment of congenital heart disease, part IV is well written to bring the busy physician an awareness of congenital heart disease and its management. The fifth section of the book, Surgery in the Cardiac Patient, contains chapters on anesthesia, preoperative and postoperative care, and pregnancy in the cardiac patient. Part VI, Disease of the Heart Secondary to Metabolic Disorders, Hyper and Hypothyroidism, is adequately discussed along with Beriberi Heart Disease. In the opinion of the reviewer, the closing chapter is one of the best features of the book. It discusses adequately the psychosomatic aspects of heart disease, how to live with a sick heart, and the rehabilitation of the cardiac patient.

G.A.Z.

PHYSICAL DIAGNOSIS. By Ralph H. Major, M.D. Professor of Medicine and of the History of Medicine, The University of Kansas, and Mahlon H. Delp, M.D., Professor of Medicine, The University of Kansas. Fifth Edition, Illustrated. Philadelphia and London: W. B. Saunders Co., 1956. Price $7.00.

Major's Diagnosis, in its fifth edition, has an added author and is almost an entirely new book. Much has been rewritten, and the arrangement of chapters and sequence is changed for the better. It is well printed on non-gloss paper, in large clear type, and is easily readable. The illustrations are profuse and well selected to illustrate the text.

CLINICAL EXAMINATIONS IN NEUROLOGY. By Members of the Section of Neurology and Section of Physiology, Mayo Clinic and Mayo Foundation for Medical Education and Research, Graduate School,

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This outline of the clinical neurologic examination was written by members of the Section of Neurology and Section of Physiology of the Mayo Clinic. As it was intended as a guide to the Fellows of the Mayo Foundation, it includes a chapter on the forms and methods used in recording the results of the neurologic examination. A series of these forms is included.

There are chapters on The Neurologic History, General Observations and Order of Procedure, The Cranial Nerves, Motor Function, Reflexes, The Sensory Examination, Mental Function, Language and Motor Speech, Autonomic Function, Clinical Examinations in Selected Problems of Pain, Electroencephalography, Electromyography and Electric Stimulation of Peripheral Nerves and Muscle, Biochemical and Pharmacologic Aids in Neurologic Diagnosis, Examinations of Cerebrospinal Fluid by Lumbar and Cisternal Puncture.

The book is well organized, well written, and literally packed with practical information. Though it is difficult to select any specific portion for comment, the anatomic diagrams in the chapter on Motor Function are unusually good and should be of help in this most important but often tedious portion of the neurologic examination. The Table of Contents, the Index and the general organization of the book make it easy to use as a reference and it is recommended not only to the neurologist but also to anyone in the active practice of medicine.

F.O.M.

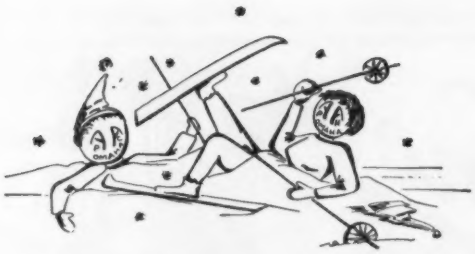
INTERNATIONAL MEDICAL FILM PROGRAM

The international medical film program, new feature of the American Medical Association's 1957 annual meeting, is creating considerable interest abroad, according to Ralph P. Creer, AMA Director of Motion Pictures and Medical Television.

The aim of the film program is to bring before the doctors attending the meeting outstanding motion pictures produced abroad dealing with many aspects of medical science. This feature is in support of the People-to-People Program which President Eisenhower launched this summer and in which the medicine and health professions are co-operating under the chairmanship of Dr. Louis H. Bauer, Secretary-General of the World Medical Association.

In connection with this film program, which is to be held at the Barbizon Plaza Hotel in New York City, June 3-7, 1957, a discussion is planned on the problems of a freer international medical film exchange. All country representatives interested in dissemination of medical knowledge by the film medium are invited. Special social events will also provide an opportunity for the participants to meet informally and discuss problems of mutual interest.

Applications for the program and further information can be obtained from the American Medical Association, Motion Pictures and Medical Television, 535 North Dearborn Street, Chicago 10, Illinois.



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THE YEAR 1956: MEDICARE

(Continued from Page 94)

terms of the law these are to be renegotiated before July 1, 1957.

When Michigan sent to Washington, D. Bruce Wiley, M.D., Chairman of the Council, MSMS, Jay C. Ketchum, Executive Vice President of Michigan Medical Service and the attorney, they found the proffered contract could not be signed on account of fine points of understanding and extended services implied. Negotiations were extended nearly three weeks before questions were resolved. The contract was signed November 15, 1956. More than ten years of administering the veterans' program pointed out features to be avoided.

We believe the trial time until July 1, 1957, will prove the Michigan concept of medicare warrants continuing. Seven state medical societies have signed to operate their own program, one has designated a commercial insurance company, and to date thirty-three have named Blue Shield.

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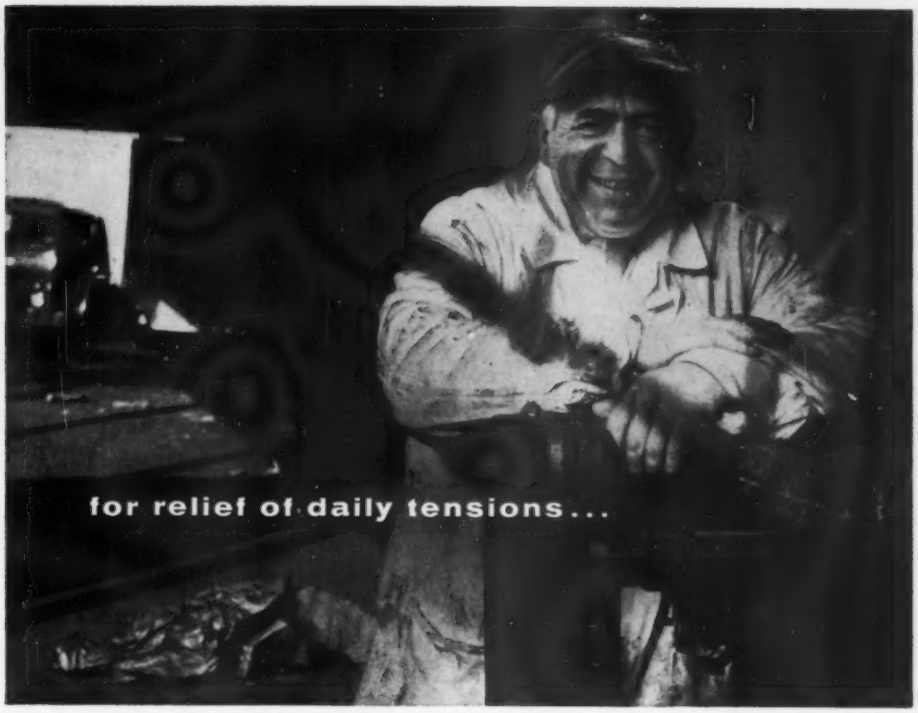

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*Ferguson, J. T.: J. Am. Geriatrics Soc. *4*:1080, 1956.

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